

JUL 16 1928

Vol. 25, No. 7

PSYCHOLOGICAL REVIEW PUBLICATIONS

July, 1928

Psychological Bulletin

EDITED BY

SAMUEL W. FERNBERGER, UNIV. OF PENNSYLVANIA

HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)

RAYMOND DODGE, YALE UNIVERSITY (*Monographs*)

MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*J. of Exp. Psych.*)

WALTER S. HUNTER, CLARK UNIVERSITY (*Index*)

HERBERT S. LANGFELD, PRINCETON UNIVERSITY, *Business Editor*

WITH THE CO-OPERATION OF

G. W. ALLPORT, DARTMOUTH COLLEGE; J. E. ANDERSON, UNIVERSITY OF MINNESOTA; J. E. COOVER, STANFORD UNIVERSITY; W. T. HERON, UNIVERSITY OF MINNESOTA; K. S. LASHLEY, CHICAGO, ILL.; M. F. MEYER, UNIVERSITY OF MISSOURI; R. M. OGDEN, CORNELL UNIVERSITY; R. PINTNER, COLUMBIA UNIVERSITY; E. S. ROBINSON, YALE UNIVERSITY.

TEST AND EDUCATIONAL PSYCHOLOGY NUMBER

EDITED BY R. PINTNER

CONTENTS

General Reviews and Summaries:

Educational Psychology: V. A. C. HENMON and M. J. NELSON, 377.

Intelligence Tests: R. PINTNER, 389. *Educational Tests:* V. JONES, 407.

Personality and Character Tests: M. A. MAY, H. HARTSHORNE and R. E. WELTY, 422.

Notes and News: 444.

PUBLISHED MONTHLY

FOR THE AMERICAN PSYCHOLOGICAL ASSOCIATION

BY THE PSYCHOLOGICAL REVIEW COMPANY

372-374 BROADWAY, ALBANY, N. Y.

AND PRINCETON, N. J.

Entered as second-class matter at the post-office at Albany, N. Y., September 20, 1922

Psychological Review Publications of the American Psychological Association

EDITED BY

HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)
MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*J. of Exp. Psych.*)
RAYMOND DODGE, YALE UNIVERSITY (*Monographs*)
SAMUEL W. FERNBERGER, UNIV. OF PENN. (*Bulletin*)
WALTER S. HUNTER, CLARK UNIVERSITY (*Index*)
HERBERT S. LANGFELD, PRINCETON UNIVERSITY, BUSINESS EDITOR.

WITH THE CO-OPERATION OF
MANY DISTINGUISHED PSYCHOLOGISTS

PSYCHOLOGICAL REVIEW

containing original contributions only, appears bi-monthly, January, March, May, July, September, and November, the six numbers comprising a volume of about 480 pages.

PSYCHOLOGICAL BULLETIN

critical reviews of books and articles, psychological news and notes, university notices, and announcements, appears monthly, the annual volume comprising about 720 pages. Special issues of the BULLETIN consist of general reviews of recent work in some department of psychology.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY

containing original contributions of an experimental character, appears bi-monthly, February, April, June, August, October, and December, the six numbers comprising a volume of about 500 pages.

PSYCHOLOGICAL INDEX

is a compendious bibliography of books, monographs, and articles upon psychological and cognate topics that have appeared during the year. The INDEX is issued annually in May, and may be subscribed for in connection with the periodicals above, or purchased separately.

PSYCHOLOGICAL MONOGRAPHS

consist of longer researches or treatises or collections of laboratory studies which it is important to publish promptly and as units. The price of single numbers varies according to their size. The MONOGRAPHS appear at irregular intervals and are gathered into volumes of about 500 pages.

ANNUAL SUBSCRIPTION RATES

Review: \$5.50 (Foreign, \$5.75). Monographs: \$6.00 per volume (Foreign, \$6.30).

Journal: \$6.00 (Foreign, \$6.25). Psychological Index: \$4.00.

Bulletin: \$6.00 (Foreign, \$6.25).

Current numbers: Review or Journal, \$1.00; Bulletin, 60c.

Review and Bulletin: \$10.00 (Foreign, \$10.50).

Journal and Bulletin: \$11.00 (Foreign, \$11.50).

Review and Journal: \$10.00 (Foreign, \$10.50).

Review, Bulletin and Journal: \$15.00 (Foreign, \$15.75).

Review, Bulletin, Journal, and Index: \$18.00 (Foreign, \$18.75).

Subscriptions, orders, and business communications may be sent direct to the

PSYCHOLOGICAL REVIEW COMPANY
PRINCETON, N. J.

THE PSYCHOLOGICAL BULLETIN

EDUCATIONAL PSYCHOLOGY

BY V. A. C. HENMON AND M. J. NELSON

University of Wisconsin

The literature of educational psychology from April, 1927, to April, 1928, does not indicate special trends or interests but is distributed widely over this diverse field. As has been indicated in earlier reviews, the subjoined bibliography lists general texts and manuals in educational psychology, studies in the teaching of educational psychology, references on the general psychology of learning, the special psychology of school subjects, the pre-school child, exceptional children, and controlled experimentation in methods, but does not include intelligence tests, educational tests, and tests of personality or character.

1. *General Texts.* Freeman (67) provides a review of recent educational psychology. General texts for classes in educational psychology are represented by Cameron (35) and the revision by Starch (164). Books of interest to all teachers of the subject are those by Judd (96) on the psychology of secondary education, by Reed (139) on the psychology of elementary school subjects, by Forest (65) on pre-school education, and by Charters (39) on the teaching of ideals. While not a text, attention should, of course, be called to the notable volume by Spearman (159). New systematic presentations are represented by LaRue (100) on mental hygiene, by Davis (48) on feeble-mindedness, and by Swift (169) on the psychology of youth.

Experimentation in the improvement of instruction in educational psychology is reported by Perry (131), by Pressey (135), by Watson (190), and by Watson and Spence (191).

Dissatisfaction with the imperfections and ambiguities of measurements in education and the inconclusiveness of experimentation,

and the need for improvement in the character of educational research is voiced in various articles by Alexander (2), Chapman (38), McCall (110), Monroe (117), Symonds (170), Whipple (194), and Woody (208).

2. *General Psychology of Learning.* There are upwards of a score of experimental studies ranging from maze learning to the evolution of concepts. Of interest in the field of transference of training are the second study of mental discipline in high school studies by Broyler, Thorndike, and Woodyard (30), and the investigation of Bowers (24). The review on work and fatigue by Spencer (163) is useful to students in this field.

A special interest in supervised study and directing study is reflected in the studies by Shreve (155), Douglas (55), Flemming and Woodring (64), Monroe (116), and others. Interested teachers should consult a valuable bibliography by Woodring and Flemming (207).

A special interest also in the problem of homogeneous grouping is shown by the volume by Ryan and Crecelius (148), and the studies by Billett (15), Miller (115), Rainey and Anderson (137), Shields (153), Ulrich (183), Viele (184), Wilson (199, 200), and Worlton (209). The college student is the subject of many investigations, notably by Book (19, 20, 21).

3. *Psychology of School Subjects.* Interest in the psychology and pedagogy of reading continues unabated. Four books by Blackhurst (17), Gates (70), Good (74), and Wiley (197), and many special investigations have appeared during the year. Investigations during 1926 and 1927 to June 30 are summarized by Gray (75).

The vocabulary studies have been enriched by the publication of the results of Horn's (85) well known investigations and by the comparative study by Dolch (52).

Arithmetic studies are represented by Buckingham (32, 33), Fowlkes (66), Heidbreder (83), O'Brien (124), Osburn (127), Otto (128), and Washburne (187).

Special interest has been shown in English and in the social studies in various experiments. Huber (86) with others on children's interest in poetry and the studies of Feasey (61) and Nesmith (122) indicate an interest in this field.

4. *Pre-School Education.* In addition to the book by Forest (65) and the record of researches in child development by Marsten (112), there are numerous experimental studies in the psychology of infancy.

5. *Miscellaneous.* In spite of the development of standard tests and new type examinations, the interest in the improvement in marks continues. The studies of Banker (10), Bolton (18), Cocking and Holy (40), Darsie (46), Lauterbach (101), and Spence (161) are representative. A special interest in the measurement of teaching ability is reflected in the studies by Ballou (9), Bathurst (13), Betts (14), Tonks (179), and Symonds (172). Sex differences are treated systematically by Lincoln (106) and are studied in several other investigations. Visual education is represented by Mead (113), Ross (143), and Wilbur (196).

BIBLIOGRAPHY

1. ADAMS, J., *Errors in School: Their Causes and Treatment*. Houghton Mifflin, 1927. Pp. 326.
2. ALEXANDER, CARTER, and others, Educational Research, Suggestions and Sources of Data with Specific Reference to Administration. *Teachers Coll. Cont.*, 1927. Pp. 41.
3. ALLBRIGHT, B. F., and HORNING, F., Typical Reading Disabilities of College Entrants. *Calif. Quart. Sec. Educ.*, 1928, 166-169.
4. ALLEN, C. N., Studies in Sex Differences. *PSYCHOL. BULL.*, 1927, 294-312.
5. ARCHER, C., Transfer of Training in Spelling. *Elem. English Rev.*, 1928, 55-61.
6. ASHBAUGH, E. J., Non-school English of High School Students. *J. Educ. Res.*, 1927, 307-313.
7. AVERILL, L. A., and MUELLER, A. D., The Effect of Practice on the Improvement of Silent Reading in Adults. *J. Educ. Res.*, 1928, 125-129.
8. AYER, F. C., The Attainment of Objectives in Handwriting. *Elementary Sch. J.*, 1927, 45-53.
9. BALLOU, F. W., Determining Who Are Superior Teachers. *Elementary Sch. J.*, 1927, 256-262.
10. BANKER, H. J., The Significance of Teachers' Marks. *J. Educ. Res.*, 1927, 159-171, 271-284.
11. BARLOW, M. C., A Learning Curve Equation as Fitted to Learning Records. *Psychol. Rev.*, 1928, 142-160.
12. BARTON, J. W., Comprehensive Units in Learning Typewriting. *Psychol. Monog.*, No. 164.
13. BATHURST, E., Alumni Evaluation of Training. *J. Ed. Adm. and Sup.*, 1927, 485-488.
14. BETTS, G. H., College Students' Reactions to Education Courses. *Sch. and Soc.*, 1927, 494-496.
15. BILLETT, R. O., A Controlled Experiment to Determine the Advantages of Homogeneous Grouping. *Ohio Ed. Res. Bull.*, 7, 133-140.
16. BIRD, G. E., The Value of Mental Hygiene in the Secondary School. *Ment. Hygiene*, 1927, 11, 253-260.

17. BLACKHURST, J. H., *Investigations in the Hygiene of Reading*. Warwick and York, 1927. Pp. 63.
18. BOLTON, F. E., Do Teachers' Marks Vary as Much as Supposed? *Educ.*, 1927, 23-39.
19. BOOK, W. F., *How to Succeed in College*. Warwick and York, 1927. Pp. 192.
20. BOOK, W. F., How Well College Students Read. *Sch. and Soc.*, 1927, 342-348.
21. BOOK, W. F., Results Obtained in a Special "How to Study" Course Given to College Students. *Sch. and Soc.*, 1927, 529-534.
22. BONSFIELD, P. and W. R., *The Mind and Its Mechanism*. E. P. Dutton, 1927. Pp. 224.
23. BOWDLEAR, C. L., An Experiment in Kinesthetic Learning. *Am. Phys. Educ. Rev.*, 1927, 100-105.
24. BOWERS, H., *Transfer Values of Secondary School Science*. U. of Toronto Press, 1927. Pp. 96.
25. BOWMAN, H., The Effect of Practice on Different Dextrality Types. *Am. J. Psychol.*, 1928, 117-120.
26. BRAINARD, P. P., Some Observations of Infant Learning and Instincts. *Ped. Sem.*, 1927, 231-254.
27. BREED, F. S., Factors Contributing to Success in College Teaching. *J. Educ. Res.*, 1927, 247-253.
28. BRIDGES, K. M. B., Occupational Interests of Three Year Old Children. *Ped. Sem.*, 1927, 415-423.
29. BRIDGES, K. M. B., Reflexes in Early Childhood; Their Development, Variability, Evanescence, Inhibition, and Relation to Instincts. *British J. Med. Psychol.*, 1927, 1-35.
30. BROYLER, C. R., THORNDIKE, E. L., and WOODYARD, E., A Second Study of Mental Discipline in High School Studies. *J. Educ. Psychol.*, 1927, 377-404.
31. BUCHANAN, W. D., Development of Leadership and Democracy Through Original Plays and Games. *Elementary Sch. J.*, 1927, 225-226.
32. BUCKINGHAM, B. R., The Additive vs. the Take-Away Method of Teaching Subtraction Facts. *Ed. Res. Bull.*, 1927, 265-269.
33. BUCKINGHAM, B. R., Upward vs. Downward Addition. *J. Educ. Res.*, 1927, 315-322.
34. BUSWELL, G. T., *A Laboratory Study of the Reading of Modern Foreign Languages*. Macmillan, 1927. Pp. 100.
35. CAMERON, E. H., *Educational Psychology*. Century, 1927. Pp. 467.
36. CARLSSON, V., *A Bibliography for Cookery Investigation Problems*. Teachers Coll. Pub., 1927. Pp. 68.
37. CATTELL, P., A Scale for Measuring Dental Age. *Sch. and Soc.*, 1928, 52-56.
38. CHAPMAN, H. B., *Organized Research in Education*. Ohio State Univ. Press, 1927. Pp. 221.
39. CHARTERS, W. W., *The Teaching of Ideals*. Macmillan, 1927. Pp. 372.

40. COCKING, W. D., and HOLY, T. E., Relation of Intelligence Scores to High School and University Marks. *Ohio Ed. Res. Bull.*, 1927, 6, 383-384.
41. COLLINS, J. E., The Intelligence of School Children and Paternal Occupation. *J. Educ. Res.*, 1928, 157-169.
42. COMMINS, W. D., and SHANKS, T. B., The Relation of Interest to Ability in High School Subjects. *Elementary Sch. J.*, 1927, 768-771.
43. CORYELL, N. G., An Evaluation of Extensive and Intensive Teaching of Literature. *Teachers Coll. Cont.*, 1927, 201.
44. CUNNINGHAM, B. V., An Experiment in Measuring Gross Motor Development of Infants and Young Children. *J. Educ. Psychol.*, 1927, 458-464.
45. DARROW, C. W., Some Psychological Conditions of Efficiency. *PSYCHOL. BULL.*, 1927, 488-505.
46. DARSIE, M. L., What Constitutes High School Scholarship? *Sch. and Soc.*, 1927, 565-566.
47. DAVIS, G., Remedial Work in Spelling. *Elementary Sch. J.*, 1927, 615-626.
48. DAVIS, P. D., *What Shall the Public Schools Do for the Feeble-minded?* Harvard Univ. Press, 1927. Pp. 225.
49. DAVIS, R. A. JR., Some Relations Between Amount of School Training and Intelligence Among Negroes. *J. Educ. Psychol.*, 1928, 127-130.
50. DE WEERDT, E. H., The Permanence of Improvement of Fifth-Grade School Children in Certain Mental Functions. *J. Educ. Res.*, 1927, 127-131.
51. DE WEERDT, E. H., A Study of the Improvability of Fifth Grade School Children in Certain Mental Functions. *J. Educ. Psychol.*, 1927, 547-557.
52. DOLCH, E. W., Combined Word Studies. *J. Educ. Res.*, 1928, 11-19.
53. DOLCH, E. W., *Reading and Word Meanings*. Ginn, 1927. Pp. 129.
54. DOLCH, E. W., Vocabulary Burden. *J. Educ. Res.*, 1928, 170-183.
55. DOUGLAS, K. R., The Experimental Comparison of the Relative Effectiveness of Two Sequences in Supervised Study. *U. of Oregon Pub.*, 1927, 1, No. 4, 173-218.
56. DOWNEY, J. E. Types of Dextrality and Their Implications. *Am. J. Psychol.*, 1927, 317-367.
57. ENGLISH, H. B., The Lecture-Conference Method vs. Individualized Instruction. *Sch. and Soc.*, 1927, 26, 172-174.
58. ESTABROOKS, G. H., A Handy Memory Trick. *Ped. Sem.*, 1927, 615-619.
59. EURICH, A. C., The Relation of Achievement Between College Fraternity and Non-Fraternity Groups. *Sch. and Soc.*, 1927, 624-630.
60. FARNSWORTH, R., SEASHORE, R. H., and TINKER, M., Speed in Simple and Serial Action as Related to Performance in Certain "Intelligence" Tests. *Ped. Sem.*, 1927, 537-551.
61. FEASEY, L., Children's Appreciation of Poems. *Brit. J. Psychol.*, 1927, 51-67.
62. FERNALD, M. R., Problems Related to the Education of Mentally Defective Children. *Elementary Sch. J.*, 1927, 205-213.

63. FISHER, V. E., A Few Notes on Age and Sex Differences in Mechanical Learning. *J. Educ. Psychol.*, 1927, 562-564.
64. FLEMMING, C. W., and WOODRING, M. N., Problems in Directing Study of High School Pupils. *Teachers Coll. Rec.*, 1928, 29, 318-33.
65. FOREST, I., *Pre-school Education*. Macmillan, 1927. Pp. 413.
66. FOWLKES, J. G., A Report of a Controlled Study of the Learning of Multiplication by Third Grade Children. *J. Educ. Res.*, 1927, 181-189.
67. FREEMAN, F. N., Recent Educational Psychology. *J. Nat. Educ. Assoc.*, 1928, 17, 42.
68. GARRETSON, A. K., A Study of Causes of Retardation Among Mexican Children in a Small Public School System in Arizona. *J. Educ. Psychol.*, 1928, 31-40.
69. GARTH, T. R. and GARRETT, J. E., A Comparative Study of the Intelligence of Indians in United States Indian Schools and in the Public or Common Schools. *Sch. and Soc.*, 1928, 178-184.
70. GARTH, A. J., *The Improvement of Reading*. Macmillan, 1927. Pp. 440.
71. GENDERELLI, J. A., Mutual Interference in the Evolution of Concepts. *Am. J. Psychol.*, 1927, 639-646.
72. GESELL, A., and LORD, E. E., A Psychological Comparison of Nursery School Children from Homes of Low and High Economic Status. *Ped. Sem.*, 1927, 84, 339-356.
73. GOOD, C. V., The Effect of Extensive and Intensive Reading on the Reproduction of Ideas or Thought Units. *J. Educ. Psychol.*, 1927, 477-485.
74. GOOD, C. V., *The Supplementary Reading Assignment*. Warwick and York. Pp. 223.
75. GRAY, W. S., Summary of Reading Investigations (July 1, 1926, to June 30, 1927). *Elementary Sch. J.*, 28, 443-459, 496-510.
76. GREENE, H. A., The Kindergarten and School Progress. *Chicago Schools Jr.*, 1927, 58-65.
77. GUILER, W. W., *A Student's Work-Book in Spelling: A Plan for Individualizing the Study of Spelling*. 1927. Oxford, Ohio. Pp. 80.
78. GUILFORD, J. P., Fluctuations of Attention with Weak Visual Stimuli. *Am. J. Psychol.*, 1927, 534-583.
79. HAGGERTY, M. E., The Improvement of College Instruction. *Sch. and Soc.*, 1928, 27, 25-37.
80. HALL, M. E., Remote Associative Tendencies in Serial Learning. *J. Exp. Psychol.*, 1928, 11, 65-76.
81. HARGREAVES, H. L., The "Faculty" of Imagination. *British J. Psychol., Mon. Suppl.*, 1927, No. 10.
82. HECK, A. O., An Analysis of Problems Involved in a Study of School Failure. *Ohio Ed. Res. Bull.*, 6, 138-143.
83. HEIDBREDER, E. F., Reasons Used in Solving Problems. *J. Exp. Psychol.*, 1927, 397-414.
84. HIMEBAUGH, O., A Vocabulary Study of the English and Metric Units of Measurement Used in Secondary-School Science Textbooks. *Ohio Ed. Res. Bull.*, 1927, 339-342.

85. HORN, E., A Basic Writing Vocabulary. *U. of Iowa Monographs in Educ.*, No. 4. Pp. 225.
86. HUBER, M. B., and others, *Children's Interests in Poetry*. Rand McNally, 1927. Pp. 233.
87. HUESTIS, R. R., and OTTO, T. P., The Grades of Related Students. *J. Heredity*, 1927, 8, 225-226.
88. HUFF, R. L., Percept Content of School Children's Minds. *Ped. Sem.*, 1927, 129-143.
89. HUMPHREY, G., A Simple Apparatus for the Class Demonstration of the Conditioned Response. *J. Educ. Psychol.*, 1928, 61-63.
90. IRVING, G. R., Fatigue in Children. *Elementary Sch. J.*, 1927, 193-201.
91. JENKINS, J. G., and DALLENBACH, K. M., The Effect of Serial Position upon Recall. *Am. J. Psychol.*, 1927, 285-291.
92. JETTE, P. L., A Study of the Learning Curves for Two Systems of Shorthand. *J. Exp. Psychol.*, 1928, 145-160.
93. JONES, D. C., and CARR-SAUNDERS, A. M., The Relation between Intelligence and Social Status among Orphan Children. *British J. Psychol.*, 1927, 343-364.
94. JONES, E. S., Prediction from High School Performances. *Sch. and Soc.*, 1928, 339-340.
95. JONES, E. S., Testing and Training the Inferior or Doubtful Freshman. *Personnel Jour.*, 1927, 182-191.
96. JUDD, C. H., *Psychology of Secondary Education*. Ginn, 1927. Pp. 545.
97. KEFAUVER, G. N. The Relative Influence of Fatigue on Pupils with Different Levels of Mentality. *J. Educ. Psychol.*, 1928, 25-30.
98. LAIRD, D., Some Effects of a Course in American Race Problems on the Race Prejudice of 450 Undergraduates at the University of Pennsylvania. *J. Abnorm. and Social Psychol.*, 1927, 235-242.
99. LANCASTER, T. J., A Study of the Voluntary Reading of Pupils in Grades IV to VIII. *Elementary Sch. J.*, 1928, 525-537.
100. LA RUE, D. W., *Mental Hygiene*. Macmillan, 1927. Pp. 443.
101. LAUTERBACH, C. E., Some Factors Affecting Teachers' Marks. *J. Educ. Psychol.*, 1928, 266-271.
102. LEHMAN, H. C., Can Students Rate Teachers? *J. Ed. Adm. and Sup.*, 1927, 459-466.
103. LEHMAN, H. C., and MICHIE, O. C., Extreme Paucity vs. Paucity of Play Interest. *Ped. Sem.*, 1927, 290-298.
104. LEHMAN, H. C., and WITTY, P. A., Play Activity and School Progress. *J. Educ. Psychol.*, 1927, 318-326.
105. LEHMAN, H. C., and WITTY, P. A., *The Psychology of Play Activities*. A. S. Barnes, 1927. Pp. 242.
106. LINCOLN, C. A., *Sex Differences in the Growth of American School Children*. Warwick and York, 1927. Pp. 189.
107. LINK, H. J., *An Experimental Inquiry into the Use of Suggesters in the Teaching of American History*. U. of Penna., 1927. Pp. 126.
108. LIPPMANN, H. S., Certain Behavior Responses in Early Infancy. *Ped. Sem.*, 1927, 424-440.

109. MACDONALD, M. E., A Catalog Study of Courses in Psychology in State Normal School and Teachers Colleges. *J. Ed. Adm. and Sup.*, 1927, 272-282.
110. MCCALL, W. A., What's the Matter with Psychology and Measurement? *J. Educ. Res.*, 1927, 179-183.
111. MCGEOCH, J. A., The Acquisition of Skill. *Psychol. Bull.*, 1927, 437-466.
112. MARSTEN, L. R., *Directory of Research in Child Development*. Nat'l Res. Council, Washington, D. C., 1927. Pp. 36.
113. MEAD, C. D., Visual vs. Teaching Methods—An Experiment. *J. Ed. Adm. and Sup.*, 1927, 505-518.
114. MEREDITH, G. P., Consciousness of Method as a Means of Transfer of Training. *Forum of Educ.*, 1927, 27-45.
115. MILLER, H. W., Segregation on the Basis of Ability. *Sch. and Soc.*, 1927, 84-88; 114-120.
116. MONROE, W. S., *Directing Learning in the High School*. Doubleday, Page, 1927. Pp. 577.
117. MONROE, W. S., and ENGELHARDT, M. D., The Techniques of Educational Research. *Bureau of Ed. Res. Bull. No. 38. U. of Ill. Bulletin*. Vol. 25, No. 19, 1928. Pp. 84.
118. MOSHER, R. M., Some Results of Teaching Beginners by the Look-and-Say Method. *J. Educ. Psychol.*, 1928, 185-194.
119. MOSHER, R. M., A Further Note on the Reliability of Reading Tests. *J. Educ. Psychol.*, 1928, 272-274.
120. MURCHISON, C., and LANGER, S., Tiedemann's Observations on the Development of the Mental Faculties of Children. *Ped. Sem.*, 1927, 34, 205-230.
121. NASH, H. B., and PHILLIPS, M. J. W., A Study of the Relative Value of Three Methods of Teaching High School Chemistry. *J. Educ. Res.*, 1927, 371-379.
122. NESMITH, M. E., An Objective Determination of Stories and Poems for the Primary Grades. *Teachers Coll. Cont.*, No. 255. Pp. 85.
123. NOTSON, E. B., The Visual Hygiene of School Children. *Sch. & Soc.*, 1928, 428-430.
124. O'BRIEN, F. P., Improvement of Instruction in Arithmetic. *U. of Kans. Bull. of Educ.*, 1927, 1, No. 4, 42.
125. ODELL, C. W., Are College Students a Select Group? *U. of Ill. Bull.*, 1927, 24, No. 36, 45.
126. ORLEANS, J. S., Influence of Grade Progress on Achievement of Sub-normal Pupils. *Teachers Coll. Rec.*, 1927, 916-927.
127. OSBURN, W. J., How Shall We Subtract? *J. Educ. Res.*, 1927, 237-246.
128. OTTO, H. J., Remedial Instruction in Arithmetic. *J. Nat. Educ. Assoc.*, 1928, 17, 87-89.
129. OTTO, H. J., Remedial Instruction in Reading. *Elementary Sch. J.*, 1928, 353-361.
130. PERRY, W. M., Measurement and Analyses of Student Achievement in a Beginning Course in Educational Psychology. *Educ.*, 1927, 12-27.

131. PERRY, W. M., Comparative University Student Achievement. *Ped Sem.*, 1927, 634-642.
132. PETERSON, G. M., Negative Acceleration with Material of Varying Difficulty. *J. Exp. Psychol.*, 1928, 40-44.
133. POTTER, W. H., and TOUTON, F. C., Achievement in the Elimination of Errors in the Mechanics of Written Expression Throughout the Junior-Senior High School. *Univ. So. Calif. Studies*, 1927, No. 3, 24.
134. PRESSEY, L. C., and PRESSEY, S. L., Analyses of Three Thousand Illegibilities in the Handwriting of Children and of Adults. *Ed. Res. Bull.*, 1927, 270-273.
135. PRESSEY, S. L., and others, *Research Adventures in University Teaching*. Pub. Sch. Pub. Co., 1927. Pp. 151.
136. PYLE, W. H., Intelligence and Teaching, An Experimental Study. *J. Ed. Adm. & Sup.*, 1927, 433-448.
137. RAINEY, H. P., and ANDERSON, H., An Experiment in Classifying High School Pupils in the Basis of Achievement. *J. Ed. Adm. & Sup.*, 1927, 528-544.
138. RANKIN, M. I., A Study of the Recurrence of Words in Certain Primers. *Elementary Sch. J.*, 1927, 278-285.
139. REED, H. B., *Psychology of Elementary School Subjects*. Ginn, 1927. Pp. 481.
140. REYNOLDS, M. M., Negativism of Pre-school Children. *Teachers Coll. Cont.*, 1928, No. 288.
141. RISSEY, F., and ELDER, H. E., The Relation between Kindergarten Training and Success in the Elementary School. *Elementary Sch. J.*, 1927, 286-289.
142. ROOT, A. R., Special Education and the Speech Defective. *J. Ed. Adm. and Sup.*, 1927, 255-265.
143. ROSS, C. L., The Value of Pictures in Teaching History. *J. Educ. Res.*, 1928, 117-124.
144. ROSS, C. C., An Experiment in Motivation. *J. Educ. Psychol.*, 1927, 337-346.
145. ROSS, C. C., and KLISE, N. M., Study Methods of College Students in Relation to Intelligence and Achievement. *J. Ed. Adm. & Sup.*, 1927, 551-562.
146. RUCH, T. C., Factors Influencing the Relative Economy of Massed and Distributed Practice in Learning. *Psychol. Rev.*, 1928, 19-45.
147. RUEDIGER, W. C., The Permanence of Educational Effects. *Sch. & Soc.*, 1927, 26, 369-373.
148. RYAN, H. H., and CRECELIUS, P., *Ability Grouping in the Junior High School*. Harcourt Brace, 1927. Pp. 223.
149. SEIBERT, L. C., An Experiment in Learning French Vocabulary. *J. Educ. Psychol.*, 1927, 294-309.
150. SHAFFER, L. F., A Learning Experiment in the Social Studies. *J. Educ. Psychol.*, 1927, 577-591.
151. SHAFFER, L. F., The Measurement of Children's Concepts. *J. Educ. Psychol.*, 1928, 41-44.

152. SHEIDEMAN, N. V., A Comparison of Two Methods of Instruction. *Sch. & Soc.*, 1927, 672-674.
153. SHIELDS, J. M., Teaching Reading through Ability Grouping. *J. Educ. Method*, 1927, 7-10.
154. SHOWALTER, B. R., Dates and Historical Perspective. *Historical Outlook*, 1928, 28-31.
155. SHREVE, F., *Supervised Study Plan of Teaching*. Johnson Pub. Co., 1927. Pp. 539.
156. SHUTTLEWORTH, F. K., The Social Relations of Children. *Psychol. Bull.*, 1927, 708-711.
157. SMITH, F. A., Differential Reactions of Human Beings in the Maze. *Ped. Sem.*, 1927, 394-405.
158. SMITH, M., Education and the Integration of Behavior. *Teachers Coll. Cont.*, 1927. Pp. 93.
159. SPEARMAN, C., *The Abilities of Man*. Macmillan, 1927. Pp. 415.
160. SPEER, D., An Analysis of the Sources of Errors in 104 Words Misspelled by Primary-School Children in the City of Baltimore. *Elementary Sch. J.*, 1928, 362-372.
161. SPENCE, R. B., The Improvement of College Marking Systems. *Teachers Coll. Cont.*, 1927, No. 252.
162. SPENCER, L. T., College Achievement of Private and Public School Entrants. *Sch. & Soc.*, 1927, 436-438.
163. SPENCER, L. T., The Curve of Continuous Work and Related Phenomena. *Psychol. Bull.*, 1927, 467-472.
164. STARCH, D., *Educational Psychology*. Revised ed. Macmillan, 1927.
165. STEVANOVIC, B. P., An Experimental Study of the Mental Processes Involved in Judgment. *British J. Psychol., Mon. Suppl.*, No. 12, 1927.
166. STONE, C. W., and CURTIS, J. W., Progress of Equivalent One-room and Graded-school Pupils. *J. Educ. Res.*, 1927, 260-264.
167. SUDWEEKS, J., Practical Helps in Teaching Spelling: Summary of Helpful Principles and Methods. *J. Educ. Res.*, 1927, 106-118.
168. SULLIVAN, E. B., Attitude in Relation to Learning. *Psychol. Rev. Monog.*, 1927. Pp. 149.
169. SWIFT, E. J., *The Psychology of Youth*. Scribner, 1927. Pp. 342.
170. SYMONDS, P. M., A Course in the Technique of Educational Research. *Teachers Coll. Rec.*, 1927, 24-30.
171. SYMONDS, P. M., Laws of Learning. *J. Educ. Psychol.*, 1927, 405-413.
172. SYMONDS, P. M., The Measurement of Teaching Efficiency in High School. *J. Ed. Adm. & Sup.*, 1927, 217-231.
173. SYMONDS, P. M., A Studiousness Questionnaire. *J. Educ. Psychol.*, 1928, 152-167.
174. TALLMAN, R. W., A Critical Analysis of Student Persistence at the State University of Iowa. *U. of Iowa Studies in Educ.*, 4, No. 1. Pp. 64.
175. TEMPLIN, O., and MCCracken, A., *A Guide to Thinking*. Doubleday, Page, 1927. Pp. 252.
176. THOMPSON, C. M., The Value of Mental Hygiene in the College. *Ment. Hygiene*, 1927, 11, 225-240.

177. THOMPSON, H., An Experimental Study of the Beginning Reading of Deaf Mutes. *Teachers Coll. Cont.*, 1927. Pp. 83.
178. TINKER, M. A., Legibility and Eye Movement in Reading. *PSYCHOL. BULL.*, 1927, 24, 621-639.
179. TONKS, H. L., *Psychological Foundations of Teaching*. Globe Book Co., 1927. Pp. 212.
180. TROW, W. C., Recall vs. Repetition in the Learning of Rate and Meaningful Material. *Am. J. Psychol.*, 1928, 112-116.
181. UHL, W. L., The Relation of Intelligence to Time Expenditures In and Out of School. *J. Ed. Adm. & Sup.*, 1928, 179-184.
182. ULLRICH, O. A., An Experimental Study of Methods of Reviewing the Lesson of the Previous Day. *J. Educ. Res.*, 1928, 211-214.
183. ULLRICH, O. A., An Experimental Study of the Effect on Learning of Sectioning College Classes on the Basis of Ability. *Bull. Univ. of Texas*. 1926.
184. VIELE, A. B., Adjustments for Individual Differences Made in Junior High Schools. *J. Educ. Res.*, 1928, 108-112.
185. VOGEL, M., and WASHBURNE, C., An Objective Method of Determining Grade Placement of Children's Reading Material. *Elementary Sch. J.*, 1928, 373-381.
186. WARING, E. B., The Relation between Early Language Habits and Early Habits of Conduct Control. *Teachers Coll. Cont.* 1927.
187. WASHBURNE, C. W., Comparison of Two Methods of Teaching Pupils to Apply the Mechanics of Arithmetic to the Solution of Problems. *Elementary Sch. J.*, 1927, 758-767.
188. WASHBURNE, C., and RATHS, L. E., The High School Achievement of Children Trained under the Individual Technique. *Elementary Sch. J.*, 1927, 214-224.
189. WASHBURNE, C., and RATHS, L., Selection of Under-Age Children for Entrance into School. *J. Ed. Adm. & Sup.*, 1928, 185-188.
190. WATSON, G. B., A Comparison of Two Types of Illustration for Teaching Educational Psychology. *J. Educ. Psychol.*, 1927, 433-444.
191. WATSON, G. B., and SPENCE, R. B., *Sketches In and Out of School*. Teachers Coll. Pub., 1927. Pp. 286.
192. WELLS, H. M., The Phenomenology of Acts of Choice. *British J. Psychol. Monog. Suppl.*, No. 11, 1927.
193. WEST, P. V., *Changing Practice in Handwriting Instruction*. Pub. Sch. Pub. Co., 1927. Pp. 142.
194. WHIPPLE, G. M., The Improvement of Educational Research. *Sch. & Soc.*, 1927, 26, 249-259.
195. WIECKING, A. M., *Education Through Manual Activities*. Ginn, 1928.
196. WILBUR, H., An Experiment in the Use of Visual Methods of Instruction. *J. Educ. Method*, 1927, 83-87.
197. WILEY, J. A., *Silent Reading and Study Objectives and Principles*. J. A. Wiley, 1927. Iowa State Teachers College. Pp. 308.
198. WILLOUGHBY, R. R., Genetic Conditions for the Rise of Genius. *Ped. Sem.*, 1927, 34, 583-590.

199. WILSON, F. T., Learning of Bright and Dull Children. *Teachers Coll. Cont.*, 1928, No. 292.
200. WILSON, F. T., Learning Curves of Boys of I.Q.'s 76-148. *J. Educ. Psychol.*, 1928, 50-57.
201. WILSON, M. O., Interests of College Students. *Am. J. Psychol.*, 1927, 409-417.
202. WILSON, W. R., The Misleading Accomplishment Quotient. *J. Educ. Res.*, 1928, 1-10.
203. WINCH, W. H., Can Observation Be Trained in School Children? *J. Educ. Res.*, 1927, 314-326.
204. WINSOR, A. L., The Relative Variability of Boys and Girls. *J. Educ. Psychol.*, 1927, 327-336.
205. WITTY, P. A., and DECKER, A. J., A Comparative Study of the Educational Attainment of Negro and White Children. *J. Educ. Psychol.*, 1927, 497-500.
206. WITTY, P. A., and LEHMAN, H. C., Drive: A Neglected Trait in the Study of the Gifted. *Psychol. Rev.*, 1927, 364-376.
207. WOODRING, M. N., and FLEMMING, C. W., A Partial Bibliography on Study. *Teachers Coll. Rec.*, 1928, 417-444, 527-549, 605-617.
208. WOODY, C. The Values of Educ. Research to the Classroom Teacher. *J. Educ. Res.*, 1927, 172-178.
209. WORLTON, J. T., The Effect of Homogeneous Grouping on the Scholastic Achievement of Bright Pupils. *Elementary Sch. J.*, 1928, 28, 336-345.
210. WRIGHT, F. A., The Correlation between Achievement and Capacity in Music. *J. Educ. Res.*, 1928, 50-56.
211. WYATT, S., An Experimental Study of a Repetitive Process. *British J. Psychol.*, 1927, 192-209.
212. YOUNG, J. B., How Emotional Traits Predispose to College Failure. *J. Educ. Psychol.*, 1927, 631-636.
213. ZYVE, C. T., Conversation Among Children. *Teachers Coll. Rec.*, 1927, 46-61.

INTELLIGENCE TESTS

BY RUDOLF PINTNER

Teachers College, Columbia University

General Books. Several books, dealing wholly or in part with intelligence tests, have recently appeared. Spearman (124) gives an extended treatment of his well-known theory. He gives a detailed criticism of existing theories, an account of the development of the two-factor theory, and assembles all the evidence for this theory. The tetrad difference method is fully explained in this book. Four general factors are discovered—general intelligence, inertia or lag, recuperation, and a conative factor called self-control. Kelley (68) would abolish the difference now made between intelligence and educational tests. He discusses the significance of the probable error and differentiates between the value of a test for group and for individual purposes. He discusses individual idiosyncrasy and emphasizes its value. About half of the book is devoted to the results of the ranking of all sorts of tests by seven judges, and to giving detailed information about each test. Two books, dealing with measurement in the high school field, have appeared, namely, by Symonds (134) and by Ruch and Stoddard (112). Both give considerable attention to the use of intelligence tests in secondary education. For the clinical worker there are also two new books, one by Wells (146) and the other by Wallin (142). Wells goes into great detail with reference to individual testing, and he gives numerous case studies. Wallin's book covers a much wider field than merely the measurement of intelligence. Incidentally a good deal of information about the development of intelligence is included by Hollingworth (60) in his broader study of mental growth.

The Meaning of Intelligence. Piéron (99) discusses the different concepts of intelligence and stresses the fact that intelligence is a value idea. Slocombe (120,122) applies the tetrad-difference criterion and supports the Spearman theory as of value in determining the selection of tests for measuring intelligence. Thomson (137) claims that the tetrad-difference criterion does not prove the two-factor theory, because a theory of many group factors would satisfy the tetrad-difference criterion equally well. Strasheim (128) builds several tests based on the Spearman theory that the eduction of relations is basic in intelligence. Davey (30) finds that pictorial tests

can measure intelligence as well as verbal tests. De Weerd (33) finds low correlations between general improvability on many tests and scores on an intelligence test. Pintner and Upshall (104), using a measure of social intelligence, find a high correlation with abstract verbal intelligence. McFarlane (87) believes that there is such a thing as practical ability, analyzing and judging about concrete spatial relations. The tests given are those of the performance and mechanical variety. The growth of intelligence of young children is studied by Cunningham (26), and he finds it practically a straight line from age $2\frac{1}{2}$ to 6. He finds a high correlation between Binet mental ages and CAVD scores at these low levels.

The Constancy of the I.Q. Hildreth (58) gives results for 441 cases tested from two to eight times. For 441 retests the correlation is .86; for 1,112 pairs of tests the correlation is .81. For 596 pairs of tests by the same examiner the correlation is .87; for 488 pairs by different examiners the correlation is .79. Gray and Marsden (52) give the final results of their Binet retesting. For first retests the correlation is .88; for all comparisons it is .85. Randall (110) gives results for 152 cases with retest intervals up to five years. The correlation is .79 and the length of the time interval has no effect. By giving the Binet test twice on the same day to thirty cases, Lincoln (80) finds a correlation of .95. The median I.Q. change is 3.4. For 144 Binet retests, Cushman (28) finds a correlation of .74. A correlation of .93 between retests on the Terman group test is reported by Broom (16). Cowdery (22) shows how the correlations between repeated Thorndike intelligence examinations decrease over a period from one to three years. Slocombe (121) argues that the I.Q. cannot be constant, and Cornell (21) stresses the fact that individuals may vary very greatly in I.Q. from test to test and hence the I.Q. is of little help in individual clinical diagnosis. Pyle (109) finds much overlapping between children of high, medium, and low I.Q.'s in different learning tests. Cureton (27) works out a method of making corrections for M.A. and C.A. in order to get I.Q.'s having the same significance at all ages.

Factors Influencing Intelligence Ratings. Merriman (90) shows that six hours' coaching on the Thorndike College entrance tests leads to an appreciable increase in score on another form of the test, though all of the improvement is limited to Part I of the test. Slocombe (119) calculates the index of intellective saturation for many retestings by means of several types of test. Since this index

is high at the second testing, we should use 25 per cent of testing time for fore-exercises. The Twenty-Seventh Yearbook of the National Society (93) is devoted to this problem of the influence of various environmental factors on test scores. In this book Freeman finds an increase from 7 to 10 points in I.Q. of foster children changed to a good environment, while Burks in a similar study finds an increase from 3 to 9 points. Willoughby and Jones contribute articles giving parent-child correlations. Denworth and Heilman show the negligible effect of length of school attendance. May and Hartshorne find correlations around .47 for honesty tests between siblings. There are many other articles centering round the general problem. Teagarden (136) finds no increase in I.Q. in two children transferred from a very bad to a very good environment over a period of five years.

Symonds (135) lists 25 factors which influence test reliability. Lanier (75) discusses the Spearman prophecy formula for length of a test and applies it to actual tests. For the Otis test it works very well, but for musical tests very badly. Skaggs (117) criticises the concepts of validity and reliability as frequently employed in test construction. Popenoe (106) criticizes the A.Q. and finds it very unreliable. The correlation between two sets of A.Q.'s derived from repetitions of intelligence and achievement tests is only .28. Abelson (1) does not find that the objective item analysis method of scoring for certain tests given to college freshmen is superior to the usual scoring method, at least with the use of college marks as a criterion. Woodyard's (150) thorough study of individual variability leads to the conclusion that an individual is as likely to be different after a few minutes as after days or weeks, up to an interval of a year at least. Correlations between tests are not lowered perceptibly by longer intervals up to a year. Walters (144) gave various tests with half time, standard time, and extended time, and found little change in the correlations with Stanford M.A. as a criterion. Farnsworth (35) shows that speed of reaction for simple reactions is not highly related to speed for choice reaction, and has no correlation at all with the usual intelligence test scores. Choice reaction is positively correlated, and the easier the test the higher it correlates.

Kuhlmann (72) has elaborated the median mental age method for calculating mental ages. Lincoln (81) proposes to standardize tests by means of a mental age distribution or by means of a chronological age group whose I.Q.'s fall between 90 and 110. Bridges (13) dis-

cusses various difficulties encountered in giving tests to pre-school children, and Seago (114) makes an analysis of language factors entering into tests of various types given to university students. Göpfert (48) studies the Binet tests singly and shows the wide overlapping from age to age and grade to grade.

Scales and Individual Tests. No new scale for the individual measurement of intelligence seems to have appeared, unless the term scale be applied to Goodenough's (46) attempt to measure intelligence by the evaluation of a child's drawing of a man. She reports high reliability and validity. In another direction the suggestion of a possible scale to measure intelligence is made by Snedden (123), who used the interview method to obtain a measure of intelligence unknown to the examinee. The possibility for the construction of such disguised intelligence tests seems to be very good. A manual of separate individual tests with directions and norms has been prepared by Bronner *et al.* (15). Bayley (6) describes performance tests suitable for three- to five-year-old children, and Blacking (7) presents the standardization of a bead-stringing test. Böge (9) describes three performance tests for "practical" intelligence, and Lichtenstein (79) discusses Gregor's vocabulary test in great detail and makes a short vocabulary test with a mental age standardization.

Group Tests. Very few new group intelligence tests have come to the notice of the reviewer. Kuhlmann and Anderson (73) have prepared a very elaborate and thorough series of group tests for ages six to maturity. The norms and standardization seem very complete. Pintner (102) presents a rapid survey test which he claims has the most objective and most rapid method of scoring of any test so far published. It is designed for grades 4 to 8. Reliability and validity coefficients are given. In the German literature, Lämmermann (74) presents a standardization of a group test made up of opposites, arithmetical problems, and so forth; while Schäfer (113) describes group completion and picture series tests. A new test of mechanical ability is described by MacQuarrie (83). Two studies about well established group tests have been made by Jones (66) and by Poull (107). The former deals with the validity of the Myers mental measure and the latter with the clinical value of the Rhode Island test.

The Feeble-minded. Bonnis (10) discusses in general the development of intelligence among the feeble-minded. He presents results of repeated tests for over 200 cases. He plots these all on one chart, from which he derives hypothetical curves for the growth of different

levels of intelligence. He finds that the I.Q. tends to decrease with repeated tests. Minogue (91) also finds that a larger percentage of feeble-minded show a loss in I.Q. rather than a gain, in a study of 441 retests of feeble-minded children, although the largest percentage, 72 per cent, show a constant I.Q., *i.e.*, not more than five points of change. Wallin (143) brings together a great mass of data on the problem of scattering on the Binet scale. He finds that normals scatter more than feeble-minded, while the unstable group of psychopaths, and the like, scatter a little more than the normals, but not enough to make this a diagnostic sign. Fox (38) compares normal and feeble-minded children of the same mental age, and finds the tests on which the feeble-minded are better and those on which the normals are better. Similarly Wilson (148) contrasts the learning ability of bright and dull children in a detailed study. In some tasks the learning curves for the bright and dull are identical; in others very different. He concludes that the more "mental" the task, the greater is the likelihood of differentiation between the bright and dull curves.

The Superior. Apart from the studies comparing bright and dull children noted in the previous paragraph, there are only two others dealing solely with bright children. Hollingworth (61) continues the report of a very bright individual who ten years ago tested at 187 I.Q. Now his CAVD score puts him about + 4 P.E. above college graduates. His scholastic record fulfills in every way the prognosis made ten years ago. Witty and Lehman (149) discuss in a theoretical article what they call "drive," especially that kind of a drive directed to overcome some weakness. If high I.Q.'s are typically well adjusted, they may not have any reason for drive, and hence may not be the outstanding geniuses of to-morrow.

The School Child. The general differences between bright and dull children as found in segregated classes are discussed by Baker (5), based upon his experience with X, Y, Z classes in Detroit. He takes up each school subject and discusses the different treatment necessary for the bright and the dull. Maher (86) reports the results of homogeneous grouping in the primary grades and considers 90 per cent successful in such classes. Levy and Bartelme (78) tested thirty children on the Binet and found that their M.A.'s agree well with achievement on Montessori materials in a Montessori school. Comparing pupils of like M.A. and C.A., but of different grades, all having I.Q.'s below 90, Orleans (95) finds that the pupils in the

higher grades achieve more on objective achievement tests. In a study of 100 nonpromoted children Stalnaker and Roller (126) found 91 per cent with I.Q.'s below 90 and 31 per cent with I.Q.'s below 70. Adler (2) gives mental test results for over 5,000 cases as part of a larger mental health survey. Distributions of I.Q.'s by schools, by sex, and by grade are given. About 5 per cent were deemed suitable for special classes.

Duthil (34) reports a French translation of one of the Otis tests and the results for 221 cases. The average score of the French thirteen-year-olds corresponds to the 12-6 U. S. A. norm. In Germany, Weigl (145) gives a description of three group tests, *i.e.*, classification, analogies, number series, given to nine- and ten-year-old children. Rogers (111) makes the second report of tests given to private school pupils. Various group tests are reported for over 3,000 cases. The median I.Q. is about 115.

In the junior high school Maddocks (84) reports the results of 100 cases of those who failed in any subject, and finds that 56 per cent fall below an I.Q. of 90. Shewrman (116) gives the correlations between the Terman group test and school marks in high school after four years for the graduating class. The coefficients lie between 43 and 70. A retest by the Terman group test after three and one-half years gives a correlation of .77. Hildreth (59) gives the results of the Thorndike College entrance test for a senior high school and finds only 6 per cent probably poor college material. A comparison of the Binet I.Q.'s and the Thorndike scores is also given. Hurd (62) reports a correlation of .76 between the score on a physics test and the average I.Q. on two intelligence tests for 58 pupils in grade XI. Strickland (129) gives results for over 1,000 senior high school pupils on an intelligence test made up of the usual type of material. Sex differences show 67 per cent of boys reaching or excelling the girls' median. In college he reports the Thorndike scores for freshmen. Sudweeks (131) reports the results for nearly 2,000 continuation school children tested by the Terman group test. The average I.Q. is 85.5.

College Students. Brigham (14), in the second annual report on scholastic aptitude tests for the College Entrance Board, gives a detailed analysis of each of the nine subtests. The tetrad difference equation is used to discover specific factors common to any two tests. The reliability of the whole test is reported to be about .95. Stalnaker (127) studies the differentiating power of the seven subtests

of the American Council psychological examination, and Crane (23) gives the results for the Thurstone and Thorndike tests at Bryn Mawr.

Many authors report correlations between intelligence tests and academic grades. Cleeton (20) finds correlations of .50 for the Thorndike College entrance and for the Iowa content examination. Guiler (53) finds correlations of .40 to .52 with the Ohio College test, Otis group, and Terman group. He considers the Otis best. Grauer and Root (51) report a correlation of .39 for the Thorndike test. They give case studies and conclude that students should not be excluded on the basis of the Thorndike score alone. Nelson and Denny (94) find correlations of .77 and .64 between the Terman group and grades in psychology. They also give results for 1,250 freshmen tested on the Terman and Thurstone tests. Carter (19) compares the correlations between an English test and semester grades of 38 with that between an intelligence test and the same grades of 45. Owens (96) compares the Army Alpha and the American Council tests given to college students.

With normal school students, we have the study of Keator and Bechtel (67), who give the results of the Thorndike intelligence test for two successive years in four Connecticut normal schools. They arrive at a tentative critical score below which a student should not fall. Waddell (140) compares the Army Alpha scores of the students in a teachers college with those in other colleges. He gives comparisons of scores and college grades and concludes that a low standing in Alpha shows unfitness in college work and in practice teaching.

Jones (65) compares the Alpha scores of Columbia College and Columbia Extension students and finds that the former make much higher scores. Kornhauser (70) studies the students in the School of Commerce and finds intelligence test scores better than high school marks for predicting college grades. Crawford (24) believes that the giving of scholarships acts as a motivation for academic work and that this raises the correlation between grades and intelligence scores. Jones (64) reports results of intelligence tests of inferior freshmen and the effect of special training. Brotemarkle (17) describes an elaborate scheme for the individual testing of college students in connection with the general problem of personnel work. Spence (125) describes the numerous factors in addition to intelligence which are related to college achievement. He finds a negative correlation between intelligence and time spent in study. He concludes that the

most important factor for success in academic work is general intelligence.

The Delinquent. Healy and Bronner (55), in their work on juvenile delinquents, find 13.5 per cent clearly feeble-minded. Their distribution of the I.Q.'s of 4,000 repeated delinquents shows a mode around 90 I.Q. A larger percentage of the feeble-minded fail to respond to probation treatment as compared with the normal. Slawson's (118) book gives a very detailed analysis of many tests given to about 500 delinquent boys. He discusses the difficulty of determining the I.Q.'s and shows the great difference in I.Q. distribution resulting from the use of 16 and 14 as a divisor. He finds the boys do better on the Thorndike nonlanguage test than on the N.I.T., and that they are up to the norms for city school children on the Stenquist. Murchison (92) gives a detailed account of the results of testing nearly 4,000 white penitentiary prisoners with the Army Alpha. He finds that they are somewhat better than the white draft, and that recidivists are better than first offenders. Kuhlmann (71) gives a percentage distribution of the I.Q.'s of delinquents in five institutions and finds from 24 to 42 per cent below an I.Q. of 75. Bridges (12) studies 33 delinquent girls and finds an average I.Q. of 88 on the N.I.T. and 82 on the Myers mental measure. He also gives results for the Mathews questionnaire and the Woodworth emotional test. Sullivan (132) gives the I.Q. distribution of boys entering Whittier State School, finding a mean I.Q. of 90, where a policy of sending the definitely feeble-minded to other institutions exists. Boynton (11) reports the results for twenty-one twelve-year-old boys in a reform school, finding all below an I.Q. of 87. Asher (4) finds a median I.Q. of 67 on the Binet for twenty boys in a reform school. On the Stenquist assembly tests they do about average and there is little overlap between the Binet and Stenquist ratings. Stryker (130) presents a case study of a delinquent boy with an I.Q. of 93, and finds that undergrading was the cause of his bad conduct.

The Deaf and Blind. Pintner (100, 103) presents the results of over 4,000 deaf children tested on the Pintner nonlanguage and educational survey tests. He compares the day and residential schools, the effect of the age of becoming deaf, and the methods of instruction. A comparison of the deaf and hearing shows the very marked retardation of the deaf in both intelligence and achievement. Hayes (54) gives a brief summary of the intelligence and achievement testing done in schools for the blind.

Racial Comparisons. Graham (50) reports group or individual tests given to over 3,000 negro children in Atlanta, Georgia. The difference between the means of the white and colored increases markedly with age, at age seven the two groups being about equal. Davis (31) gives results for 222 negro normal school students and finds a median I.Q. of 78 on the Terman group test. He believes that lack of schooling is largely responsible for this. Herskovits (57) presents results for 539 negro college students on the Thorndike College entrance test. He finds no significant correlation between intelligence score and anthropological measures of amount of white mixture.

Garth and Garrett (43) give the results of the N.I.T. for over 2,000 Indian children. They find an increase in I.Q. with increase in white mixture. The I.Q.'s of the Indians range from 70 to 91 as compared with a white I.Q. of 100. Garth (42) finds a correlation of .42 between degree of white blood and intelligence in a study of Indians. Fitzgerald and Ludeman (37) find a slight correlation among Indians between percentage of white blood and intelligence. The median I.Q. on intelligence tests is about 6.88.

Paschal and Sullivan (97) give the results for 204 nine-year-old and 211 eleven-year-old Mexican children on six performance tests. They fall below the American norm on all tests. There is a positive correlation between amount of white blood and intelligence score. Garretson (41) finds Mexican children lower than American children on both the N.I.T. and the Myers mental measure, the difference being greater on the former test.

Graham (49) finds Chinese children in San Francisco superior to American on the Kohs test, but inferior on the mentimeter and N.I.T. On the Stanford their average I.Q. is 87. Darsie (29) reports results for 658 American born Japanese children. Their median I.Q. is about 90 on the Binet, but they are equal to the American norms on the Army Beta. Mead (88) tests Italian children in America and finds a mean I.Q. of 95 on the Binet for 43 cases. On the Otis group test only 7 per cent out of 276 cases are above the median American I.Q. The mean score increases with increase in amount of English spoken in the home, with length of stay of fathers in this country, and with progress up the grades. Pintner (101) compares 271 Belgian children tested in Belgium with the American norms on the Pintner nonlanguage test and finds no difference in the mean scores for ages nine to fourteen.

The Employee. In his book on employment psychology Burt (18) discusses intelligence tests and their uses in various fields of employment. Two studies have appeared dealing with the intelligence of policemen. Merrill (89) reports an average Army Alpha score of 104 for 113 applicants to the police force. Fernald and Sullivan (36) find a mean score of 82 on the Army Alpha for 1,712 men on a city police force. They give a distribution according to the army ratings. Pyle (108) gives intelligence tests to teachers and finds that "intelligence is a just-barely-perceptible factor in school success." Pond (105) combines seven tests from Army Alpha and Beta into a new test and gives this to all newly hired workers in a metal industry for a year. Critical score ranges for different jobs are then determined. Freyd (39) gives a description of available tests with a summary of results for the selection of typists and stenographers.

Inheritance. Goodenough (47) finds a correlation of about .3 between the intelligence of 380 pre-school children and the educational status of their parents. Gesell and Lord (45) compare nursery school children of equal age of low and high economic status and find the psychographs of the latter in general superior to those of the former group. Aldrich (3) compares the I.Q.'s of 1,100 high school pupils according to the fathers' occupations. The labor groups are slightly lower than the nonlabor groups. Jones and Carr-Saunders (63) find the same relationship of I.Q.'s to occupation among orphan children brought up in the same environment as among children not in orphanages. Blanchard and Paynter (8) give the I.Q.'s for 80 children from "marginal" families, and find over 50 per cent below I.Q. 90. Sutherland and Thomson (133) in England and Lentz (77) in this country discuss the correlation between I.Q. and size of family. The former find negative correlations of about .2 and the latter of .3. Lentz shows a steady decrease in I.Q. from 108 for only children to 80 for families of 12 or more. Wahlquist (141) compares urban and rural children and finds the usual superiority of the urban group.

Miscellaneous. Thorndike (138, 139) finds that boys excel girls by about 5 points on the I.E.R. tests at ages thirteen to sixteen and by about 17 points at ages seventeen to eighteen. Differential selection is probably operating. Boys are slightly more variable than girls, and there are more very high scores among the boys. Whipple (147) finds high school boys superior to girls on the Alpha. He finds the subtests on which they show their superiority. Good-

enough (48) makes a summary of the sex differences so far reported and gives her results for 300 pre-school children. She finds the girls superior on verbal tests and the boys on formboard tests. Perkins (98) finds a positive correlation between M.A. and number of teeth, after eliminating C.A., in a study of 555 children. Sheldon (115) duplicates Naccarati's investigation with 450 students and finds a correlation of .14 between intelligence and the morphologic index.

Gaskill *et al.* (44) study the ability to estimate intelligence from photos and find a median correlation of +.42 between the estimates of 274 judges and the photos of 12 eleven-year-old boys with I.Q.'s ranging from 18 to 171. Magson (85) finds that an estimate of intelligence based upon a five-minute interview correlates only +.15 with objective tests of intelligence. The correlation between a mature estimate and intelligence tests is .54. Wyatt (151) finds a low correlation between monotonous work (soap wrapping) and intelligence for 30 factory girls. Henig (56) believes there is a correlation between intelligence and freedom from accidents among 164 boys in a vocational school. Koch (69) shows the similarity of the test scores for a pair of Siamese twins. In a study of 62 pairs of chums, Furfey (40) finds low but positive correlations for C.A., M.A., height, weight, and developmental age. Lehman and Witty (76) find that dull children take more to social games than do bright children. The index of social participation decreases with increase of M.A. and C.A.

Dearborn (32) uses the Binet and other intelligence tests to determine intellectual regression and progression with adult subjects. Lowe (82) gives a percentage distribution of the I.Q.'s for 344 unmarried mothers, finding 24 per cent with an I.Q. below 75. Cunningham (25) reports a scale for measuring the gross motor development of young children and finds it correlates highly with mental age. Zyve (152) describes a scientific aptitude test which differentiates between science and nonscience students.

BIBLIOGRAPHY

1. ABELSON, H. H., *The Improvement of Intelligence Testing*. T. C. Contrib. to Educ. No. 273, T. C. Bureau of Publications, N. Y. 1927. Pp. 71.
2. ADLER, H. M. (Ed.), *Report of Mental Health Survey of La Salle, Peru and Oglesby*. Dept. of Public Welfare, Illinois (no date).
3. ALDRICH, S. C., *The Intelligence of High-School Pupils*. *Sch. Rev.*, 1927, 35, 699-706.

4. ASHER, E. J., The Training Needs of Reform School Boys Experimentally Determined. *J. of Delin.*, 1927, 11, 151-158.
5. BAKER, H. J., *Characteristic Differences in Bright and Dull Pupils*. Pub. School Pub. Co., Bloomington, Ill., 1927. Pp. viii+118.
6. BAYLEY, N., Performance Tests for Three, Four and Five-Year-Old Children. *Ped. Sem.*, 1926, 33, 435-454.
7. BLACKING, E., Standardization of a Bead-Stringing Test. *Ped. Sem.*, 1927, 34, 620-633.
8. BLANCHARD, P., and PAYNTER, R. H., Socio-psychological Status of Children from Marginal Families. *The Family*, 1927, 3-10.
9. BÖGE, K., Eine Untersuchung über praktische Intelligenz. *Zsch. f. angew. Psychol.*, 1927, 28, 85-139.
10. BONNIS, L., *Le développement de l'intelligence chez les arriérés*. Van-nes: Commelin, 1926. Pp. 70.
11. BOYNTON, P., Mental Development of Twelve Year Old Boys in the Kentucky Houses of Reform. *J. Delin.*, 1926, 10, 532-534.
12. BRIDGES, J. W., A Study of a Group of Delinquent Girls. *Ped. Sem.*, 1927, 34, 187-204.
13. BRIDGES, K. M. B., Critical Notes on Mental Tests for Children of Pre-School Age. *Ped. Sem.*, 1927, 34, 38-44.
14. BRIGHAM, C. C., et al., *Second Annual Report of the Commission on Scholastic Aptitude Tests*. College Entrance Board, 1927. Pp. 37.
15. BRONNER, A. F., et al., *A Manual of Individual Mental Tests and Testing*. Boston: Little, Brown, 1927. Pp. x+287.
16. BROOM, M. E., A Study of the Constancy of the I.Q. *Educ. Res. Bull.*, Los Angeles City Schools, Vol. IX, No. 2, 1927.
17. BROTEMARKLE, R. A., College Student Personnel Problems. *J. Appl. Psych.*, 1927, 11, 415-436.
18. BURT, H. E., *Principles of Employment Psychology*. Boston: Houghton Mifflin, 1926. Pp. 568.
19. CARTER, T. M., A Standardized Mental Test vs. an Unstandardized English Test as a Means of Predicting Success in College. *Sch. and Soc.*, 1927, 26, 151-152.
20. CLEETON, G. U., The Predictive Value of Certain Measures of Ability in College Freshmen. *J. Educ. Res.*, 1927, 15, 357-370.
21. CORNELL, E. L., Taking the Dogma out of the I.Q. *Mental Hygiene*, 1927, 11, 804-810.
22. COWDERY, K. M., Repeated Thorndike Intelligence Examinations. *Sch. and Soc.*, 1928, 27, 367-369.
23. CRANE, E., The Results of Some Psychological Tests at Bryn Mawr College. *Sch. and Soc.*, 1927, 25, 640-644.
24. CRAWFORD, A. B., Effect of Scholarships. A Study in Motivation. *J. Pers. Res.*, 1925-26, 4, 391-404.
25. CUNNINGHAM, B. V., An Experiment in Measuring Gross Motor Development of Infants and Young Children. *J. Educ. Psych.*, 1927, 18, 458-464.

26. CUNNINGHAM, K. S., *The Measurement of Early Levels of Intelligence*. T. C. Contrib. to Educ., No. 259, N. Y., 1927. Pp. 74.
27. CURETON, E. E., The Measurement of Brightness. *J. Educ. Psych.*, 1928, 19, 88-98.
28. CUSHMAN, C. L., A Study of the Reliability of Mental Tests as Used in Oklahoma City. *J. Appl. Psych.*, 1927, 11, 509-511.
29. DARSIE, M. L., *The Mental Capacity of American Born Japanese Children*. Comparative Psych. Mono., 1925, 3, No. 15. Pp. 89.
30. DAVEY, C. M., A Comparison of Group Verbal and Pictorial Tests of Intelligence. *Brit. J. Psych.*, 1926-27, 17, 27-48.
31. DAVIS, R. A., Some Relations Between Amount of School Training and Intelligence Among Negroes. *J. Educ. Psych.*, 1928, 19, 127-130.
32. DEARBORN, G. V. N., The Determination of Intellectual Regression and Progression. *Am. J. of Psychiatry*, 1927, 6, 725-741.
33. DE WEERDT, E. H., A Study of the Improvability of Fifth Grade School Children in Certain Mental Functions. *J. Educ. Psych.*, 1927, 18, 547-557.
34. DUTHIL, R., Les tests collectifs d'intelligence et leurs applications. *Rev. Péd.*, 1925, 87, 260-270.
35. FARNSWORTH, P. R., et al., Speed in Simple and Serial Action as Related to Performance in Certain Intelligence Tests. *Ped. Sem.*, 1927, 34, 537-551.
36. FERNALD, G. M., and SULLIVAN, E. B., Personnel Work with the Los Angeles Police Department. *J. Delinq.*, 1926, 10, 252-267.
37. FITZGERALD, J. A., and LUDEMAN, W. W., The Intelligence of Indian Children. *J. of Comp. Psych.*, 1926, 6, 319-328.
38. FOX, E. J., The Diagnostic Value of Group Tests as Determined by the Qualitative Differences Between Normal and Feeble-minded Children. *J. Appl. Psych.*, 1927, 11, 127-134.
39. FREYD, M., Selection of Typists and Stenographers: Information on Available Tests. *J. Personnel Res.*, 1926-27, 5, 490-510.
40. FURFEY, P. H., Some Factors Influencing the Selection of Boys' Chums. *J. Appl. Psych.*, 1927, 11, 47-51.
41. GARRETSON, O. K., A Study of Causes of Retardation Among Mexican Children in a Small Public School System in Arizona. *J. Educ. Psych.*, 1928, 19, 31-40.
42. GARTH, T. R., The Intelligence of Mixed Blood Indians. *J. Appl. Psych.*, 1927, 11, 268-275.
43. GARTH, T. R., and GARRETT, J. E., A Comparative Study of the Intelligence of Indians in United States Indian Schools and in the Public or Common Schools. *Sch. and Soc.*, 1928, 27, 178-184.
44. GASKILL, P. C., FENTON, N., and PORTER, J. P., Judging the Intelligence of Boys from Their Photographs. *J. Appl. Psych.*, 1927, 11, 394-403.
45. GESELL, A., and LORD, E. E., A Psychological Comparison of Nursery School Children from Homes of Low and High Economic Status. *Ped. Sem.*, 1927, 34, 339-356.

46. GOODENOUGH, F. L., *Measurement of Intelligence by Drawings*. Yonkers: World Book, 1926. Pp. xiv+177.
47. GOODENOUGH, F. L., The Relation of the Intelligence of Pre-School Children to the Education of Their Parents. *Sch. and Soc.*, 1927, 26, 54-56.
48. GOODENOUGH, F. L., The Consistency of Sex Differences in Mental Traits at Various Ages. *Psych. Rev.*, 1927, 34, 440-462.
49. GÖFFERT, C., *Über Binet-Simon Teste*. Friedrich Manns Pädagogisches Magazin, Heft 1116, 1927. Pp. 87.
49. GRAHAM, V. T., The Intelligence of Chinese Children in San Francisco. *J. Comp. Psych.*, 1926, 6, 43-71.
50. GRAHAM, V. T., Health Studies of Negro Children. Intelligence Studies of Negro Children in Atlanta, Georgia. *Pub. Health Rep.*, 1926, 41, 2759-2783.
51. GRAUER, D., and ROOT, W. T., The Thorndike Intelligence Tests and Academic Grades. *J. Appl. Psych.*, 1927, 11, 297-318.
52. GRAY, P. L., and MARSDEN, R. E., The Constancy of the Intelligence Quotient—Final Results. *Brit. J. Psych.*, 1926-27, 17, 20-26.
53. GUILER, W. S., The Predictive Value of Group Intelligence Tests. *J. Educ. Res.*, 1927, 16, 365-374.
54. HAYES, S. P., Ten Years of Psychological Research in Schools for the Blind. *Publications of the Penna. Institution for the Blind*, 1927, No. 4. Pp. 16.
55. HEALY, W., and BRONNER, A. F., *Delinquents and Criminals. Their Making and Unmaking*. New York: Macmillan, 1926. Pp. 317.
56. HENIG, M. S., Intelligence and Safety. *J. Educ. Res.*, 1927, 16, 81-87.
57. HERSKOVITS, M. J., On the Relation Between Negro-White Mixture and Standing in Intelligence Tests. *Ped. Sem.*, 1926, 33, 30-42.
58. HILDRETH, G., Stanford-Binet Retests of 441 School Children. *Ped. Sem.*, 1926, 33, 365-386.
59. HILDRETH, G., Thorndike College Entrance Test Results in a Senior High School. *T. C. Record*, 1927, 28, 1035-1044.
60. HOLLINGWORTH, H. L., *Mental Growth and Decline*. N. Y.: Appleton, 1927. Pp. xii+396.
61. HOLLINGWORTH, L. S., Subsequent History of E—; Ten Years After the Initial Report. *J. Appl. Psych.*, 1927, 11, 385-390.
62. HURD, A. W., The Intelligence Quotient as a Prognosis of Success in Physics. *School Review*, 1926, 34, 123-128.
63. JONES, D. C., and CARR-SAUNDERS, A. M., The Relation Between Intelligence and Social Status Among Orphan Children. *Brit. J. of Psych.*, 1926-27, 17, 343-364.
64. JONES, E. S., Testing and Training the Inferior Freshman. *Univ. of Buffalo Studies*, 5, No. 3, 1927.
65. JONES, H. E., A Comparison of the Intelligence of Extension and College Undergraduate Students. *Sch. and Soc.*, 1927, 26, 469-470.
66. JONES, V. A., A Study of the Non-Verbal Nature and Validity of Myers' Mental Measure. *J. Educ. Res.*, 1927, 16, 203-209.

67. KEATOR, M., and BECHTEL, H. W., *Report of the Thorndike Intelligence Examination, Part III, as Administered in the Connecticut State Normal Schools*. Hartford, Conn.: State Board of Education, 1927. Pp. 38.
68. KELLEY, T. L., *Interpretation of Educational Measurements*. Yonkers: World Book Co., 1927. Pp. xiii+363.
69. KOCH, H. L., Some Measurements of a Pair of Siamese Twins. *J. Comp. Psych.*, 1927, 7, 313-333.
70. KORNHAUSER, A. W., Test and High School Records as Indicators of Success in an Undergraduate School of Business. *J. Educ. Res.*, 1927, 16, 342-356.
71. KUHLMANN, F., Report of Director. *Division of Research, State Board of Control, Minnesota*, 1926.
72. KUHLMANN, F., A Median Mental Age Method of Weighing and Scaling Mental Tests. *J. Appl. Psych.*, 1927, 11, 181-198.
73. KUHLMANN, F., and ANDERSON, R. G., *Intelligence Tests for Ages Six to Maturity*. Manual and Material. Educational Test Bureau, Minneapolis, Minn., 1927. Pp. 87.
74. LÄMMERMANN, H., Bericht über die Eichung einer Serie von Gruppentests für acht-bis vierzehnjährige Volksschüler. *Zsch. f. angew. Psychol.*, 1926, 27, 1-41.
75. LANIER, L. H., Prediction of the Reliability of Mental Tests and Tests of Special Abilities. *J. Exper. Psych.*, 1927, 10, 69-113.
76. LEHMAN, H. C., and WITTY, P. A., *The Psychology of Play Activities*. N. Y.: Barnes, 1927. Pp. 242.
77. LENTZ, T., Relation of I.Q. to Size of Family. *J. Educ. Psych.*, 1927, 18, 486-496.
78. LEVY, D. M., and BARTELME, P., The Measurement of Achievement in a Montessori School and the Intelligence Quotient. *Ped. Sem.*, 1927, 34, 77-89.
79. LICHTENSTEIN, A., Ueber den Wert der Gregorschen Definitionsmethode zur Beurteilung der Intelligenz bei Kindern von 5 bis 14 Jahren. *Zeitschrift f. Kinderforschung*, 1926, 32, 41-80.
80. LINCOLN, E. A., The Reliability of the Stanford-Binet Scale and the Constancy of Intelligence Quotients. *J. Educ. Psych.*, 1927, 18, 621-626.
81. LINCOLN, E. A., Tentative Standards for the Lincoln Hollow Square Form Board. *J. Appl. Psych.*, 1927, 11, 264-267.
82. LOWE, C., The Intelligence and Social Background of the Unmarried Mother. *Mental Hygiene*, 1927, 11, 783-794.
83. MAC QUARRIE, T. W., A Mechanical Ability Test. *J. Personnel Res.*, 1926-27, 5, 329-337.
84. MADDOCKS, C. W., The Factor of Intelligence in School Failures. *School Review*, 1927, 35, 602-611.
85. MAGSON, E. H., How We Judge Intelligence. *Brit. J. Psych. Mono. Suppl.*, 1926, No. 9. Pp. 115.
86. MAHER, E. A., An Experiment in Homogeneous Grouping. *J. Educ. Method.*, 1925-26, 5, 25-28.

87. MCFARLANE, M., A Study of Practical Ability. *Brit. J. Psych. Mono. Suppl.*, 1925, No. 8. Pp. 75.
88. MEAD, M., Group Intelligence Tests and Linguistic Disability Among Italian Children. *Sch. and Soc.*, 1927, 25, 465-468.
89. MERRILL, M. A., Intelligence of Policemen. *J. Personnel Res.*, 1926-27, 5, 511-515.
90. MERRIMAN, C., Coaching for Mental Tests. *Educ. Admin. and Super.*, 1927, 13, 59-64.
91. MINOGUE, B. M., The Constancy of the I.Q. of Mental Defectives. *Mental Hygiene*, 1926, 10, 751-758.
92. MURCHISON, C., *Criminal Intelligence*. Clark University, Worcester, 1926. Pp. 291.
93. *National Society for the Study of Education*. Twenty-seventh Yearbook, 1928, Part I, pp. 465; Part II, pp. 397.
94. NELSON, M. J., and DENNY, E. C., The Terman and Thurstone Group Tests as Criteria for Predicting College Success. *Sch. and Soc.*, 1927, 26, 501-502.
95. ORLEANS, J. S., Influence of Grade Progress on Achievement of Sub-normal Pupils. *T. C. Record*, 1927, 28, 916-927.
96. OWENS, W. A., On a Certain Value of the Thurstone Tests in Predicting Scholarship. *Educ. Admin. and Super.*, 1927, 13, 495-499.
97. PASCHAL, F. C., and SULLIVAN, L. R., Racial Differences in the Mental and Physical Development of Mexican Children. *Comp. Psych. Mono.*, 1925, 3, No. 14. Pp. 76.
98. PERKINS, F. J., The Relation of Dentition to Mental Age. *Ped. Sem.*, 1926, 33, 387-398.
99. PIÉRON, H., The Problem of Intelligence. *Ped. Sem.*, 1926, 33, 50-60.
100. PINTNER, R., The Survey of Schools for the Deaf: Psychological. *Am. Annals of the Deaf*, 1927, 72, 377-414.
101. PINTNER, R., Non-Language Tests in Foreign Countries. *Sch. and Soc.*, 1927, 26, 374-376.
102. PINTNER, R., A New Intelligence Test for Survey Purposes. *T. C. Record*, 1927, 29, 18-23.
103. PINTNER, R., A Mental Survey of the Deaf. *J. Educ. Psych.*, 1928, 19, 145-151.
104. PINTNER, R., and UPSHALL, C. C., Some Results of Social Intelligence Tests. *Sch. and Soc.*, 1928, 27, 369-370.
105. POND, M., Selective Placement of Metal Workers. *J. Personnel Res.*, 1926-27, 5, 345-368, 405-417.
106. POPENOE, H., A Report of Certain Significant Deficiencies of the Accomplishment Quotient. *J. Educ. Res.*, 1927, 16, 40-47.
107. POULL, L. E., Clinical Values of the Rhode Island Intelligence Test and the Town Picture Game. *J. Appl. Psych.*, 1927, 11, 68-72.
108. PYLE, W. H., Intelligence and Teaching, an Experimental Study. *Educ. Admin. and Super.*, 1927, 13, 433-448.
109. PYLE, W. H., The I.Q. and the Individual. *Sch. and Soc.*, 1927, 26, 788-790.

110. RANDALL, F. B. A., A Study on the Constancy of the I.Q. *Sch. and Soc.*, 1927, 26, 311-312.
111. ROGERS, A. L., *The Classification of Pupils in Private Schools*. Private School Teachers Association, Philadelphia, Pa., Pamphlet No. 2, 1927.
112. RUCH, G. M., and STODDARD, G. D., *Tests and Measurements in High School Instruction*. Yonkers: World Book Co., 1927. Pp. xix+381.
113. SCHÄFER, P., Fähigkeitsprüfungen bei der aufnahme in die höhere Handelsschule. *Zeitschr. f. Päd. Psychol.*, 1926, 27, 94-100.
114. SEAGO, D. W., An Analysis of Language Factors in Intelligence Tests. *Mental Measurement Mono.*, 1, No. 1. Baltimore: Williams & Wilkins (no date).
115. SHELDON, W. H., Morphologic Types and Mental Ability. *J. Personnel Res.*, 1926-27, 5, 447-451.
116. SHEWRMAN, W. D., A Study of the Intelligence and Achievement of the June, 1925, Graduating Class of the Grover Cleveland High School, St. Louis. *School Review*, 1926, 34, 137-146, 219-226.
117. SKAGGS, E. B., Some Critical Comments on Certain Prevailing Concepts and Methods Used in Mental Testing. *J. Appl. Psych.*, 1927, 11, 503-508.
118. SLAWSON, J., *The Delinquent Boy*. Boston: Badger, 1926. Pp. viii+477.
119. SLOCOMBE, C. S., The Influence of Practice in Mental Tests. *Forum of Educ.*, 1926, 4, 173-179.
120. SLOCOMBE, C. S., The Constancy of "g," General Intelligence. *Brit. J. Psych.*, 1926-27, 17, 93-110.
121. SLOCOMBE, C. S., Why the I.Q. Is Not and Cannot Be Constant. *J. Educ. Psych.*, 1927, 18, 421-423.
122. SLOCOMBE, C. S., On Mental Testing—A Pragmatic Theory. *J. Educ. Psych.*, 1928, 19, 1-24.
123. SNEDDEN, D. S., *A Study in Disguised Intelligence Tests*. T. C. Contrib. to Educ., No. 291, Teachers College, Columbia University, 1927. Pp. 48.
124. SPEARMAN, C., *The Abilities of Man*. N. Y.: Macmillan, 1927. Pp. viii+415.
125. SPENCE, R. B., Factors Related to College Achievement. *T. C. Record*, 1927-28, 29, 504-514.
126. STALNAKER, E. M., and ROLLER, R. D., A Study of One Hundred Non-Promoted Children. *J. Educ. Res.*, 1927, 16, 265-270.
127. STALNAKER, J. M., American Council Psychological Examination for 1926 at Purdue University. *Sch. & Soc.*, 1926, 27, 86-88.
128. STRASHEIM, J. J., *A New Method of Mental Testing*. Baltimore: Warwick & York, 1926. Pp. 158.
129. STRICKLAND, V. L., Relative Levels of Intelligence in College and High School. *Kansas State Agricultural College Bulletin*, 1926, 10, No. 4. Pp. 114.
130. STRYKER, S. B., Undergrading as a Cause of Delinquency—Report of a Case. *Sch. & Soc.*, 1927, 26, 821-822.
131. SUDWEEKS, I., Intelligence of the Continuation School Pupils of Wisconsin. *J. Educ. Psych.*, 1927, 18, 601-611.

132. SULLIVAN, E. B., Age, Intelligence and Educational Achievement of Boys Entering Whittier State School. *J. Delinq.*, 1927, 11, 23-38.
133. SUTHERLAND, H. E. G., and THOMPSON, G. H., The Correlation between Intelligence and Size of Family. *Brit. J. Psych.*, 1926-27, 17, 81-92.
134. SYMONDS, P. M., *Measurement in Secondary Education*. New York: Macmillan, 1927. Pp. xvii+588.
135. SYMONDS, P. M., Factors Influencing Test Reliability. *J. Educ. Psych.*, 1928, 19, 73-87.
136. TEAGARDEN, F. M., Change in Environment and the I.Q. *J. Appl. Psych.*, 1927, 11, 289-296.
137. THOMSON, G. H., The Tetrad-Difference Criterion. *Brit. J. Psych.*, 1926-27, 17, 235-255.
138. THORNDIKE, E. L., *et al.*, On the Variability of Boys and Girls from Thirteen to Eighteen. *Ped. Sem.*, 1926, 33, 182-184.
139. THORNDIKE, E. L., *et al.*, Sex Differences in Status and Gain in Intelligence Scores from Thirteen to Eighteen. *Ped. Sem.*, 1926, 33, 167-181.
140. WADDELL, C. W., The Prognostic Value of Army Alpha Scores for Success in Practice-Teaching. *Educ. Admin. & Super.*, 1927, 13, 577-592.
141. WAHLQUIST, J. T., Intelligence of Rural and Urban Children. *Elem. Sch. J.*, 1926-27, 27, 682-684.
142. WALLIN, J. E. W., *Clinical and Abnormal Psychology*. Boston: Houghton Mifflin, 1927. Pp. xxii+649.
143. WALLIN, J. E. W., A Further Note on Scattering in the Binet Scale. *J. Appl. Psych.*, 1927, 11, 143-154.
144. WALTERS, F. C., *A Statistical Study of Certain Aspects of the Time Factor in Intelligence*. T. C. Contrib. to Educ., No. 248, 1927. Pp. 82.
145. WEIGL, F., Begabungsdifferenzen zwischen 9 und 10 Lebensjahr. *Zeitschr. f. Päd. Psych.*, 1926, 27, 275-282.
146. WELLS, F. L., *Mental Tests in Clinical Practice*. Yonkers: World Book Co., 1927. Pp. x+315.
147. WHIPPLE, G. M., Sex Differences in Army Alpha Scores in the Secondary School. *J. Educ. Res.*, 1927, 15, 269-275.
148. WILSON, F. T., *Learning of Bright and Dull Children*, T. C. Contrib. to Educ., No. 292, Teachers College, Columbia University, 1928. Pp. 56.
149. WITTY, P. A., and LEHMAN, H. C., Drive: A Neglected Trait in the Study of the Gifted. *Psych. Rev.*, 1927, 34, 364-376.
150. WOODYARD, E., *The Effect of Time upon Variability*. T. C. Contrib. to Educ., No. 216. Bureau of Publications, Teachers College, Columbia University, 1926. Pp. 56.
151. WYATT, S., An Experimental Study of a Repetitive Process. *Brit. J. Psych.*, 1926-27, 17, 192-209.
152. ZYVE, D. L., A Test of Scientific Aptitude. *J. Educ. Psych.*, 1927, 18, 525-546.

EDUCATIONAL TESTS

BY VERNON JONES¹

Clark University

General. Four textbooks concerned with the general problems of educational testing have appeared during the year in this country. Ruch and Stoddard (58) give a brief sketch of the history and present status of measurement in high schools. The uses and limitations of tests at this level are discussed and the point is made that the greatest possible benefits are not being obtained in secondary school testing at present, due mainly to the inaccuracies of measuring instruments, on the one hand, and to current misunderstanding among school officials of the meaning of results, on the other. Symonds (63) summarizes the reasons why better measurement is needed in high schools. One of his main points is that ordinary school marks at present are seriously unreliable, and he recommends the use of standardized tests and new type informal examinations as means for the improvement of conditions. The values of tests in predicting success in academic work, clerical and mechanical pursuits are examined in detail. Kelley (38) deals with the general problem of interpretation of test results in light of their reliabilities and validities. He makes distinctions among the various purposes for which tests are used. Minimal reliabilities required of a test for these various purposes are discussed.

In addition to these three books which have appeared in their first editions, mention should be made of the appearance of a revision of the elementary text on measurement by Lincoln (41).

Extension of Educational Measurement. The ordinary observer is baffled by the rapid increase in the number of proposed measuring instruments. No entrance examination must be passed by a new examination which applies for admission to the company of standard measures. There is no standard test for standard tests. Some of the new survey tests are of high quality and are carefully standardized; some are merely lists of questions about which we are given little or no experimental evidence. Due to limited space, all tests

¹ The writer is indebted to Miss Dorothea Johannsen, a graduate student of Clark University, for assistance in the preparation of this review.

which have been proposed for general use cannot be mentioned; however, in noting the increase in the number of tests in old fields and the extension of measurement to new fields, the most significant new survey tests will be mentioned. Tests which are primarily diagnostic or prognostic in nature are discussed under separate headings later.

Important contributions in the form of series of tests have been made by three groups of workers. First, the Columbia Research series, under the authorship of Wood and others, contains new tests in algebra (51) and American history (10). Second, the workers in the Modern Foreign Language Study of the American Council on Education have devised seven tests: The Alpha French test, by Henmon and others (31); the Alpha German test, by Henmon and others (32); the Alpha Spanish test, by Buchanan and others (8); the Beta French test, by Greenberg and Wood (26); the Beta Spanish test, by Callcott, Williams, and Wood (9); the French grammar test, by Cheydleur (14); and the German reading scales, by Van Wageningen and Patterson (73). Each test of these two series is accompanied by a manual which contains norms and directions for administering and scoring. Third, the Harvard test series (29) contains twelve tests in Latin, one in French, one in high school chemistry, two in physics, and two in social studies. The test elements were selected on the basis of careful analyses of current textbooks, questions from college entrance examinations, word counts, and the like. Facts on reliability are given for two out of the eighteen tests. Norms are reported for about one-half the tests. Thirty copies of each test are bound in loose-leaf pads.

Sangren and Woody (59) have devised a new reading test for grades IV to VIII. Parker and Waterbury (52) have also produced a reading test. They recommend it for use in grades II to IX. Beery (4) has attempted to devise a test for use with very young children to determine their readiness to begin reading. Abbott (1) has made a set of standard themes for use in analyzing and grading general merit in English composition.

Several tests may be mentioned to illustrate the extension of measurement to new or relatively new fields. Toops (72) describes a test which purports to measure study habits. In constructing the test an effort was made to select sub-tests which yield high correlations with scholarship but low correlations with general intelligence. The test has been given to the entering classes in many colleges and a

follow-up program is planned. O'Brien and Giblette (45) have sought to measure achievement in sewing. Richards (56) describes a test which he has devised in biology. This test was found to correlate .71 with the only other test in this field, namely, the Ruch-Crossman test. The author reports a reliability of .62, and gives tentative norms based on 303 high school and college students.

Other new tests which have come to the attention of the reviewer are as follows: Test in American poetry, by Cavins (12); a reading test in Spanish (15) and a Spanish vocabulary test (16) by Contreras, Broom, and Kaulfers; a primary reading test, by Williams (79); a narrative reading test, by Stone and Buehrmann (60); a reading test, by Van Wagenen (73); and a test in food preparation, by Streeter and Trilling (62).

Intensive Study of Current Instruments and Methods. Horn (35) emphasizes the importance of examining the content that goes into tests in light of its social value. Hill (34) stresses the point that tests should be constructed only by those who are familiar with the objectives, the content, and the methods in a given subject.

The necessity for higher reliability and validity in tests is strongly emphasized by several writers. Kelley (38) concludes that unless our measures are greatly improved in reliability and validity, the accomplishment quotient technique must be discarded for use in individual diagnosis. He states that current group measures of intelligence and educational achievement are rather unreliable for individual measurement, and he feels that any ratio based on these two is especially unreliable since they measure to such a large extent the same thing. He says: "On the average, in the neighborhood of 90 per cent of the capacity measured by an all-round achievement battery score and the capacity measured by a general intelligence test is one and the same thing." For practical school purposes he considers it vastly more important that a test should have high reliability and validity than that it should have widely established norms. Pope-noe (53) finds the reliability of the accomplishment quotient to be .28. Moreover, he finds a correlation of $-.46$ between accomplishment quotients and intelligence quotients. He concludes that the reliability of the A.Q. is too small to justify the use of this measure educationally. Ruch and Stoddard (58) emphasizes the necessity for improvement in the reliability and validity of tests if they are to be relied upon for individual measurement. They point out the fact that though a test may be suitable for group diagnosis, it may yield

very unreliable results for an individual. Hull (36) studies the efficiency of tests in forecasting future performance. He concludes that unless radical improvement takes place in the accuracy of measurement, tests are "doomed to operate at an efficiency of 40 or 50 per cent or less." Muenzinger (44) emphasizes individual idiosyncrasies and concludes that tests at their present stage of reliability and validity are untrustworthy for use in studying individuals.

Madsen (43) studied the reliability of the scoring of an objective examination. Forty-seven normal school seniors were asked to score one Stanford achievement test each. The experimenter reports that 15 of these 47 untrained scorers made mistakes aggregating 33 in number. Fifteen out of the 33 errors were made in connection with omitted items.

Thurstone (70) examined the assumptions underlying the construction of product scales in handwriting, drawing, and composition on the basis of the Cattell-Fullerton theorem. He concludes that neither are equally often noticed differences equal nor are equal differences equally often noticed, unless the discriminial dispersions of the specimens are equivalent. Finding that none of the authors using this scaling technique has proved that the variabilities in judgments of all specimens were uniform, he feels that it is unlikely that this assumption of equality in dispersion is justified and, therefore, that the original scales are most probably faulty. The author (71) extends his examination to another method of scale construction, namely, the variability of grade method as illustrated in the construction of the Trabue language scales of 1916. He emphasizes the point that the probable error method makes the invalid assumption that the variability in each of the different grades is the same. He offers a solution to the difficulty noted. Using the method which he proposed in 1925, Thurstone shows how the Trabue test, and others similarly constructed, can be scaled so as to take into account both lateral displacement and differences in dispersion from grade to grade.

Brigham (7) studied the relative merits of the current methods of determining the reliability of tests, and he concludes that the two-forms method and the split-half method yield approximately equivalent results.

Use of Tests in Evaluating Instruction. Ruch and Stoddard (58) state that the use of tests for the supervision of instruction has been the most important function of such measures. Wallis (76) emphasizes the importance of educational tests in comparing schools.

O'Hearn (46) describes a coöperative survey conducted in the schools of Rochester, N. Y. He feels that tests are of great value to teachers and supervisors in taking inventory. He thinks, however, that unless remedial measures follow the evaluating of conditions the testing program is a waste of time and money.

Five out of the six important educational surveys reported in 1927 made extensive use of educational tests in evaluating instruction. In the survey of Jacksonville, Florida (66), tests were given in reading, arithmetic, spelling, history, and English grammar and composition. Practically all conclusions on the efficiency of instruction are based on comparison of the groups with grade or age standards. In the survey of Lynn, Massachusetts (68), educational tests were given in reading, arithmetic, and spelling in the elementary schools. The evaluation of instruction in the subjects measured is based exclusively on the test results; however, the survey staff feels that it is impossible at the present stage of development to measure successfully in such subjects as history and geography or to gauge appreciation by means of tests. A large testing program was also included in the survey of Beaumont, Texas (65). Besides the Stanford achievement test, which was given to over 3,700 children, measurements were made in certain grades by means of composition scales and reading tests. Evaluation of instruction is made by comparison of children with grade and age standards. Much emphasis is placed on the use of the results of tests for diagnosis and remedial teaching. Five educational tests were used in the survey of the schools at Fort Lee, N. J. (67). Comparisons of pupils with age and grade norms are made. The use of diagnostic tests to locate class and individual difficulties and the use of practice tests to remedy weaknesses in drill subjects are recommended. In the survey of the Cape Towns (30) large numbers of tests were given for the purpose of evaluating instruction in the elementary and secondary schools. All interpretations are based on the comparison of pupils with grade norms. Further testing is strongly recommended for the purpose of improving classification. The only printed survey conducted during the year in which no tests were used is the self-survey conducted by the local school officials in Hamtramck, Michigan.

Uses of Tests in Improving Marks and Marking Systems. Symonds (63) argues for the basing of school marks in the school subjects exclusively on measurable achievement. He does not object to marks on studiousness or effort, nor to estimates of character traits;

indeed, he recommends them. However, he feels that these should be reported separately, and not included in and confused with the marks in the school subjects. He thinks that standardized tests and teachers' informal examinations should play a large part in determining marks in measurable school achievement. Ruch and Stoddard (58) recommend standardized educational tests as being valuable for purposes of supplementing teachers' marks in determining promotion or nonpromotion.

The advantages of the new type questions employed in mental and educational tests have impressed teachers, and as a result there has been a rapid spread in the use of new-type informal examinations for determining marks. Many articles deal with the use, the limitations, and methods for the improvement of these new type informal tests. Ruch and Stoddard (58), Symonds (63), and James (37) give directions for constructing them. Ruch and others (57) discuss in detail objective methods of examining in the social studies. The authors favor the use of improved informal examinations based on local curricula rather than the development of standardized tests for national use, because they fear that the latter may tend to perpetuate the traditional curriculum in such subjects. The results of several important experimental investigations are included.

Tharp (69) compares the old with the new type examination in French. He concludes that for testing in grammar the new type examination is more economical in time and more reliable than the old type. Waples (77) advocates the multiple choice exercise as a device for directing the pupil in his study. Its chief use he thinks is in analyzing problems. Weinland (78) stresses the value of the true-false examination for purposes of discovering weaknesses in teaching as well as weaknesses in pupils' knowledge. He feels, however, that the content of the examination is of greater importance than the form in which the questions are framed.

Wood (80) conducted an extensive experimental study to determine the value of new type examinations in measuring achievement in foreign languages. His results, based on the analysis of examinations given to thousands of high school students, lead one to conclude that there is an important place for the new type exercises in teachers' informal testing and in state examinations in languages. Valuable suggestions are given on the construction of examinations.

Wood (81) studied the validity of different types of tests. She finds that a fifteen-minute new-type examination is more valid than

a fifty-minute essay-type test. The completion type stood highest in point of validity. The validity of the true-false test was raised from .75 to .85 by correcting for chance. Ruch and Stoddard (58) feel that the new-type examination can test a more extensive sampling of knowledge in a given time than the essay type. They make a distinction, however, between an extensive sampling of knowledge provided by the new-type test and an intensive sampling supplied by the traditional written examinations. They conclude that the new-type examination is superior to the traditional essay type in validity and reliability per unit of testing time, but they remind the reader that ordinarily the new objective examination provides little opportunity for training in organization and expression of thought. They find that the validity of the true-false test is greatest when the examinees have been instructed not to guess and when the R-W method of scoring is used. Lohr (42) concludes that the reliability of the recognition type of test is decreased when much guessing occurs. He reports that completion type of test has higher reliability than true-false or multiple choice. Fritz (22) notes that on the true-false test students guess "true" rather than "false" in the ratio 62:38. The problem of cheating on the new-type examination has been studied from one angle by Bird (5). Giles (25) suggests a modification of the multiple choice test in order to expose the student to a larger per cent of right statements. He recommends that in the case of each question all responses except one be true—in a few cases all should be true. The task would be the identification of the incorrect responses. Foster and Ruch (19) discuss the correction for chance in multiple choice tests. They conclude that

the formula $R - \frac{W}{N-1}$ over-penalizes for guessing. Walker (75)

studies mathematically certain questions suggested by the true-false test. Probably the most practical contribution is a table indicating the frequency with which 2, or 3, or 4, or 5, etc., true statements (or false statements) would occur in sequence by the law of chance.

Arnold (2) studies the discrepancies between the results obtained by the true-false and the simple recall examination, and concludes that where the group tested is homogeneous in training the true-false test is more reliable, otherwise the simple recall type is more reliable. Hammond (28) studies the reliability of an informal English test consisting of three ten-minute sub-tests of the true-false, multiple choice, and completion types. She finds the reliability of the

whole test to be .92 which was distinctly higher than that found for the old type examination.

Use of Tests in Diagnosis and Remedial Teaching. Gates (23) reports on the construction and use of diagnostic tests in primary reading. This work represents a significant contribution in the constructing of diagnostic tests in light of the psychology of learning in the subject tested. Elsewhere (24) the same worker describes the method of constructing and validating his tests for the measurement and diagnosis of reading abilities in grades III to VIII. The tests are constructed on the theory that there are several types of reading activities and that the different types are dependent upon specific techniques, abilities, or skills which may be acquired in whole or in part by practice. Tests were selected to measure four aspects of reading: first, the ability to understand the general significance of a passage; second, the ability to use main ideas of a paragraph to solve related issue; third, the ability to understand precise directions; and fourth, the ability to note suggested details. Age and grade norms are reported. Facts on reliability are also given. Two equivalent forms are available. The author concludes that in the hands of an examiner of moderate skill the results based on both forms of the test will be sufficiently accurate for use in individual diagnosis. Reavis and Breslich (55) have published a diagnostic test in the fundamentals of arithmetic for grades VII to IX. No statistical information is given concerning reliability or validity. Thompson and Orleans (50) have devised two Latin tests which they recommend for diagnostic use. Potter and Touton (54) describe a test with a reliability of .80, which they feel to be of value in diagnosing errors in written composition. Grade norms from VII to XII and age norms from 11 to 19 are given. They recommend the pretest—teach—retest—teach formula, as does O'Hearn (46) also. Fowlkes (20) reports on the use of the results of inventory tests for diagnosis. Certain (13) finds that instruction in English and spelling is more effective when it makes use of the results of diagnostic testing. A plan for the use of tests in English teaching is presented in detail.

While some authors recommend the use of tests in diagnosis, others affirm that diagnosis on the basis of present-day tests is likely to be fallible. Herron (33) claims that there is too much diagnosis and prognosis in the schools on the basis of inadequate tests. Kelley (38) makes a distinction between group diagnosis and indi-

vidual diagnosis, but he says that a technique which is inaccurate in a study of individual cases can be discarded generally with little loss. He utters a warning against too great dependence on individual scores from the average test, and especially does he emphasize the need for radical improvement in intelligence and educational measures before a ratio between these two—such as the accomplishment quotient—will be sufficiently reliable for use in individual diagnosis. Symonds (63) states that in order to diagnose individual difficulties a test should contain several items of the same type so that real deficiencies may be distinguished from chance errors.

In several of the articles already mentioned, and in one of the surveys, reference was made to the use of practice tests for remedial work in certain skills. In addition to these, mention should be made of a report by Fowlkes (20) on the use of test material for diagnosis and practice in connection with multiplication combinations in the third grade. He finds that the experimental group, which used the test material, spent 70 per cent less time on certain combinations and yet was 50 per cent more efficient in solving them than other groups in the same school system. He suggests the use of tests in directing practice work more intelligently. Though the values of practice tests were emphasized fairly frequently in the literature, no new tests were reported.

Use of Tests in Prognosis and Guidance. Symonds (64) urges more research both for the improvement of reliability of present measures of aptitude and also for the development of prognostic tests in new fields. He emphasizes especially the need for better measures of aptitude for clerical and mechanical pursuits. Friedl (21) reports some preliminary results obtained with a test of foreign language prognosis. The test proved to be fairly successful in predicting which students would receive percentage grades above 80 and which would receive failing grades at the end of their first six weeks in study of foreign languages. Kelley (38) concludes that, where equally reliable tests are available, achievement tests in a given subject are to be preferred to intelligence tests for prediction of success in that subject. He thinks that educational tests are, all things considered, preferable at all levels between the second grade of the primary school and the third year of high school for prognosis of school success. He concludes from his study of test reliability that achievement test results are more dependable for prognosis of further school achievement than for diagnosis. Ruch and Stod-

dard (58) find that educational tests have a higher predictive value of future school success than teachers' marks or intelligence tests. On the basis of a study of entrance test results and academic work of students at Bryn Mawr College, Crane (18) concludes that the best predictive measure of scholastic success in college is a combination of intelligence test scores and achievement ratings. Carter (11) finds that scores obtained on the Psychological Examination of the National Council on Education, 1926 edition, correlate .45 with the first semester grades in English, while the scores on an informal test in English requiring only about one-third the time correlate .38 with these grades. Haddock (27) recommends educational quotients based on the Stanford achievement test as important measures for predicting success in high school. She finds that 70 per cent of those failing in the first year of high school were below the median E.Q. at the end of the elementary school period.

Two articles present data on old prognostic tests. Blakey (6) finds a correlation of .67 between scores on the Wilkins prognostic test in modern languages and teachers' marks. Bear (3) reports a correlation of .25 between results obtained on the Iowa physics aptitude placement test and one year's grades in physics. He finds that the test is better for estimating general academic standing than for predicting success in physics. The correlation between the test scores and one year's average academic grades was found to be .64.

Several new tests have been devised, and two interesting proposals have been made concerning the extension of prognostic testing to untried fields. Zyve (82) gives a report on the construction and use of a test of aptitude for scientific study. The examination presumes no information beyond that ordinarily acquired by the end of the elementary school course. Correlations were obtained between the test results and scores assigned by competent judges to research students in physics, chemistry, and electrical engineering. In physics the correlation was .95 as determined from a study of 10 cases. In chemistry the correlation based on 21 cases was .77. In electrical engineering the correlation based on 19 cases was .89. The correlation between scores on this test and intelligence measures was low. From these facts the author concludes that the test measures to a large degree scientific aptitude rather than scientific training or general intelligence. Limp (40) describes a new battery of tests for use in predicting success in certain commercial subjects. He reports a correlation of .63 between test results and subsequent class

grades in typewriting, and a correlation of .61 between test scores and grades in shorthand. Orleans and Solomon (49) report a Latin prognosis test. Stoy (61) has attempted to find some test for aptitude in mechanical drawing. After discarding many measures on the basis of experimental evidence, he finally decides upon a battery of six tests which he recommends. Cox (17) suggests that a committee of judges of art devise tests for ability in industrial arts, in the crafts and minor arts, in architecture, and in painting. Knight (39) recommends the construction of tests to measure teaching aptitude of prospective high school instructors.

Bibliographies of Tests. Attending the rapid increase in the number of tests, there is a growing demand for annotated bibliographies and selected lists. Several important lists of such a nature have appeared recently. Kelley (38) presents a list of the most important tests, and a ranking on the basis of merit is assigned to each test by from five to seven recognized authorities in the field of measurement. In a separate list the author includes extremely valuable facts concerning reliability of each test; grades for which it is suitable; time required to administer and score; cost; publisher; etc. Ruch and Stoddard (58) give classified lists of tests which they consider especially suitable for use in junior and senior high schools. Certain selected tests are described in detail. Symonds (63) also discusses selected tests of the high school level. Odell (47, 48) has issued a second revision of his lists of elementary and high school tests. He includes only those which according to his judgment possess enough merit to warrant their use. A brief comment comprising a few sentences is made on each test listed.

BIBLIOGRAPHY

1. ABBOTT, A., *Composition Standards*. New York: Bureau of Publications, Teachers College, Columbia University, 1927.
2. ARNOLD, H. L., Analysis of Discrepancies between True-False and Simple Recall Examinations. *J. Educ. Psychol.*, 1927, 18, 414-420.
3. BEAR, R. M., The Predictive Value of the Iowa Physics Aptitude Placement Test. *J. Appl. Psychol.*, 1927, 11, 381-384.
4. BEERY, F. M., The Baltimore Readiness Test for Beginning Reading. *Childhood Educ.*, 1927, 3, 222-223.
5. BIRD, C., The Detection of Cheating in Objective Examinations. *Sch. & Soc.*, 1927, 25, 261-262.
6. BLAKEY, R., Use of Prognostic Tests in Modern Language. *School Rev.*, 1927, 35, 692-698.

7. BRIGHAM, C. C., et al. *First Annual Report of the Commission on Scholastic Aptitude Tests*. New York: College Entrance Examination Board, 1926. Pp. 36.
8. BUCHANAN, M. A., CRAWFORD, J. P. W., KENISTON, H., and HENMON, V. A. C., *American Council Spanish Alpha Test*. Yonkers: World Book Co., 1927.
9. CALLCOTT, F., WILLIAMS, R. H., and WOOD, B. D., *American Council Spanish Beta Test*, Yonkers: World Book Co.
10. CARMEN, H. J., BARROWS, T. N., and WOOD, B. D., *Columbia Research Bureau American History Test*. Yonkers: World Book Co., 1927.
11. CARTER, T. M., A Standardized Mental Test vs. an Unstandardized English Test as a Means of Predicting Success in College English. *Sch. & Soc.*, 1927, 26, 151-152.
12. CAVINS, L. V., *Test in American Poetry*. Bloomington, Ill.: Public School Publishing Co., 1927.
13. CERTAIN, C. C., *Teaching English with Standard Tests*. Parts I and II. Ann Arbor, Mich.: Edwards Bros., 1927.
14. CHEYDLEUR, F. D., *American Council French Grammar Test*. Preliminary Experiment. University of Wisconsin, Bulletin 8, Madison, 1927. Test published by World Book Co., Yonkers, 1927.
15. CONTRERAS, M., BROOM, E., and KAULFERS, W., *A Silent Reading Test in Spanish*. Bloomington, Ill.: Public School Publishing Co., 1927.
16. CONTRERAS, M., BROOM, E., and KAULFERS, W., *A Test of Spanish Vocabulary*. Bloomington, Ill.: Public School Publishing Co., 1927.
17. COX, G. J., Shall We Have Intelligence Tests in Art? *T. C. Record*, 1927, 28, 690-695.
18. CRANE, E., The Results of Some Psychological Tests at Bryn Mawr College. *Sch. & Soc.*, 1927, 25, 640-644.
19. FOSTER, R. R., and RUCH, G. M., On Corrections for Chance in Multiple-Response Tests. *J. Educ. Psychol.*, 1927, 18, 48-51.
20. FOWLKES, J. G., Report of a Controlled Study of the Learning of Multiplication by Third Grade Children. *J. Educ. Res.*, 1927, 15, 181-189.
21. FRIEDL, B. C., A Study in Foreign Language Prognosis. *Modern Language J.*, 1927, 298-314.
22. FRITZ, M. F., Guessing in a True-False Test. *J. Educ. Psychol.*, 1927, 18, 558-561.
23. GATES, A. I., *The Improvement of Reading*. New York: Macmillan, 1927.
24. GATES, A. I., Methods of Constructing and Validating the Gates Reading Tests. *T. C. Record*, 1927, 29, 148-159.
25. GILES, J. T., Improving the Objective Test Question. *School Rev.*, 1927, 35, 286-288.
26. GREENBERG, J., and WOOD, B. D., *American Council French Beta Test*. Yonkers: World Book Co., 1927.
27. HADDOCK, N. P., The Use of the Stanford Achievement Test to Indicate High School Success. *Sch. & Soc.*, 1927, 25, 114-116.
28. HAMMOND, E. L., A Study of the Reliability of an Objective Examination in Ninth Grade English. *School Rev.*, 1927, 35, 45-54.

29. *Harvard Tests*, by INGLIS, A. A., GERRY, H. L., BLOCK, N. H., BURLINGAME, P. M., TWIGG, A. M., and KEPNER, T. Boston: Ginn, 1927.
30. *Harvard University, Education in Twelve Cape Towns*, by Members of Staff of Graduate School of Education. Cambridge, Mass., Printed 1927.
31. HENMON, V. A. C., COLEMAN, A., and TRABUE, M. A., *American Council French Alpha Test*. Yonkers: World Book Co., 1927.
32. HENMON, V. A. C., MORGAN, B. Q., HINZ, S. M., PURIN, C. M., and ROSSBERG, E., *American Council German Alpha Test*. Yonkers: World Book Co., 1927.
33. HERRON, J. S., The Misuse of Educational Measurements. *Bull. Dept. Elemen. School Principals*, 1927, 73-80.
34. HILL, H. C., Tests and Testing in the Social Studies. *Teach. J. & Abs.*, 1927, 2, 351-355.
35. HORN, E., What Should Tests Measure? *Texas Outlook*, 1927, 11, 7-8.
36. HULL, C. L., Correlation Coefficient and Its Prognostic Significance. *J. Educ. Res.*, 1927, 15, 327-338.
37. JAMES, H. W., Technique in the Construction of a Teacher's Own Objective Tests. *Peabody J. of Educ.*, 1927, 240-243.
38. KELLEY, T. L., *Interpretation of Educational Measurements*. Yonkers: World Book Co., 1927. Pp. xiii+363.
39. KNIGHT, F. B., The Selection of High School Teachers. *Stud. Educ.*, 1926, 35-37.
40. LIMF, C. E., A Work in Commercial Prognosis. *J. Educ. Res.*, 1927, 16, 48-56.
41. LINCOLN, E. A., *Beginnings in Educational Measurements* (2d Revision). Philadelphia: Lippincott, 1927. Pp. 159.
42. LOHR, V. C., A Comparison of Some Tests Given in High School Physics. *School Sci. & Math.*, 1927, 74-85.
43. MADSEN, I. N., *Standard Tests and the Improvement of Teaching*. Lewiston State Normal School Bull., 1927.
44. MUENZINGER, K. F., Critical Note on the Reliability of a Test. *J. Educ. Psychol.*, 1927, 18, 424-428.
45. O'BRIEN, F. P., and GIBLETTE, C. T., A Project Test of Achievement in Sewing. *School Rev.*, 1927, 35, 217-221.
46. O'HEARN, J., The Coöperative Survey. *J. Educ. Res.*, 1927, 15, 79-86.
47. ODELL, C. W., *Educational Tests for Use in Elementary Schools* (2d Revision). Univ. of Ill.: Educ. Record Circular, 1927, 24, No. 49. Pp. 44.
48. ODELL, C. W., *Educational Tests for Use in High Schools* (2d Revision). Univ. of Ill.: Educ. Record Circular, 1927, 24, 5-43.
49. ORLEANS, J. S., and SOLOMON, M., *Orleans-Solomon Latin Prognosis Test*, Yonkers: World Book Co., 1926.
50. ORLEANS, J. S., and THOMPSON, H. G., *Latin Survey*. Bulletin 892. Albany, N. Y.: State Dept. of Educ., 1928.
51. OTIS, A. S., WOOD, B. D., *Columbia Research Bureau Algebra Test*. Yonkers: World Book Co., 1927.

52. PARKER, C. M., and WATERBURY, E. A., *Detroit Reading Test*. Yonkers: World Book Co., 1927.
53. POPENOE, H., A Report of Certain Significant Deficiencies of the Accomplishment Quotient. *J. Educ. Res.*, 1927, 16, 40-47.
54. POTTER, W. H., and TOUTON, F. C., Achievement in the Elimination of Errors in the Mechanics of Written Expression. *Univ. So. Cal. Stud.* (2d Series), 1927, 3. Pp. 24.
55. REAVIS, W. C., and BRESLICH, E. R., *Diagnostic Tests in the Fundamental Operations of Arithmetic and in Problem Solving*. School of Educ., Univ. of Chicago, 1927.
56. RICHARDS, O. W., The Test Construction in Less Standardized Subjects Illustrated by the Richards Biology Test. *School Sci. & Math.*, 1927, 27, 22-27.
57. RUCH, G. M., DEGRAFF, M. H., GORDON, W. E., MCGREGOR, J. B., MAUPIN, N., and MURDOCK, J. R., *Objective Examination Methods in the Social Studies*. Chicago: Scott, Forsman & Co., 1926. Pp. 116.
58. RUCH, G. M., and STODDARD, G. D., *Tests and Measurements in High School Instruction*. Yonkers: World Book Co., 1927. Pp. xix+381.
59. SANGREN, P. V., and WOODY, C., *Sangren-Woody Reading Test*. Yonkers: World Book Co., 1927.
60. STONE, C. R., and BUEHRMANN, A., *Narrative Reading Tests*. Bloomington, Ill.: Public School Publishing Co., 1927.
61. STOV, E. G., Tests for Mechanical Drawing Aptitude. *Personal. J.*, 1927, 6, 93-101.
62. STREETER, N., and TRILLING, M., *A Test at the Completion of Food Preparation Courses in the Junior High School*. Bloomington, Ill.: Public School Publishing Co., 1927.
63. SYMONDS, P. M., *Measurement in Secondary Education*. New York: Macmillan, 1927. Pp. xvii+588.
64. SYMONDS, P. M., Needed Research in the Field of Measurement in Secondary Education. *J. Educ. Res.*, 1927, 16, 119-126.
65. Teachers College, Columbia University: *Report of the Survey of the Schools of Beaumont, Texas*, by Institute of Educational Research, Division of Field Studies, G. D. Strayer, Director. New York, 1927.
66. Teachers College, Columbia University: *Report of the Survey of the Schools of Duval County, Florida, Including the City of Jacksonville*, by Institute of Educational Research, Division of Field Studies, G. D. Strayer, Director. New York, 1927.
67. Teachers College, Columbia University: *Report of the Survey of the Schools of Fort Lee, N. J.*, by Institute of Educational Research, Division of Field Studies, G. D. Strayer, Director. New York, 1927.
68. Teachers College, Columbia University: *Report of the Survey of the Schools of Lynn, Mass.*, by Institute of Educational Research, Division of Field Studies, G. D. Strayer, Director. New York, 1927.
69. THARP, J. B., The New Examinations vs. the Old in Foreign Languages. *School & Soc.*, 1927, 26, 690-694.

70. THURSTONE, L. L., Equally Often Noticed Differences. *J. Educ. Psychol.* 1927, 18, 289-293.
71. THURSTONE, L. L., The Unit of Measurement in Educational Scales. *J. Educ. Psychol.*, 1927, 18, 505-524.
72. TOOPS, H. A., The Prediction of Scholastic Success in College. *School & Soc.*, 1927, 25, 265-268.
73. VAN WAGENEN, M. J., *Reading Scales*. Bloomington, Ill.: Public School Publishing Co., 1927.
74. VAN WAGENEN, M. J., and PATTERSON, S. H., *American Council on Education German Reading Scales*. Bloomington, Ill.: Public School Publishing Co., 1927.
75. WALKER, H. M., Certain Mathematical Questions Suggested by the True-False Test. *Amer. Math. Monthly*, 1927, 34, 504-515.
76. WALLIS, B. C., *The Technique of Examining Children*. London: Macmillan, 1927. Pp. 136.
77. WAPLES, D., The Best-Answer Exercise as a Teaching Device. *J. Educ. Res.*, 1927, 15, 10-21.
78. WEINLAND, J. D., A Note on the Right-Wrong Examination. *J. Educ. Psychol.*, 1927, 18, 266-267.
79. WILLIAMS, A. J., *Primary Reading Test*. Bloomington, Ill.: Public School Publishing Co., 1927.
80. WOOD, B. D., *New York Experiments with New Type Modern Language Tests*. New York: Macmillan, 1927.
81. WOOD, E. P., Improving the Validity of Collegiate Achievement Tests, *J. Educ. Psychol.*, 1927, 18, 18-25.
82. ZYVE, D. L., A Test of Scientific Aptitude. *J. Educ. Psychol.*, 1927, 18, 525-546.

PERSONALITY AND CHARACTER TESTS¹

BY MARK A. MAY, HUGH HARTSHORNE AND RUTH E. WELTY

Teachers College, Columbia University

In addition to the usual summary of articles dealing with personality and character tests, we shall include here titles on ratings, general discussions and experiments bearing directly on this subject. The rapidly developing interest in the physiological and morphological aspects of personality in Europe has resulted in a sufficient number of articles and books to justify a special heading for them. Articles reporting the use of old techniques, because of interest in the results only, are listed in Section G.

A. Summaries. No less than eighteen summaries have appeared during the calendar year of 1927. In addition to the 1926 summary of 196 titles by May, Hartshorne and Welty (80) the following authors have contributed lists which include references to the problem of measurement in this field: Faris (34) summarizes the literature from the general field of personality with reference to sociology. His summary contains 117 titles, some of which concern methods of research. Froemming (40) offers a short bibliography of character tests of 74 titles. Furfey (42) offers an annotated bibliography of 54 titles. Pangburn (88) has summarized the outstanding contributions of psychology to personality including the measuring movement. Roback's (96) comprehensive bibliography of 3,341 titles contains references to measurement. It is complementary to the Manson bibliography published in 1926, overlapping it in only about 15 per cent of the citations. Shuttleworth's (107) bibliography contains 116 titles covering the period from January, 1924, to October, 1927. Updegraph (128) refers to 57 scales and devices. G. B. Watson has two summary articles. The first (132) contains 167 titles each briefly annotated. The other (135) overlaps the first to a considerable degree but has supplementary references. In his recent text (133) he gives a carefully annotated list of actual tests. Kimball Young (145, 146) has two summary articles, both bearing on the field of social psychology. One contains 279 titles and the other 189. The classifications are of special interest.

¹ This bibliography has been prepared in connection with an Inquiry in Character Education made possible by a grant to Teachers College from the Institute of Social and Religious Research.

Summaries of more specialized nature have been made covering several aspects of personality. G. W. Allport (4) summarizes the work of the past dozen years on traits. He finds much confusion of terminology, and proposes a definition of "trait." The bibliography has 46 titles. Farr (35) has a bibliography of 31 titles on the relation of morphological features to character and personality traits. Landis (65) summarizes the various methods of detecting deceit including association methods, respiratory and cardiac measurements. He concludes that there is good experimental evidence that deception can be detected by these methods, but doubts the practical significance of the results. Starbuck (114, 115) has summarized the work that is being done at the University of Iowa. A list of 30 titles is appended to Witty and Lehman's study of "drive" (142).

B. Batteries Including Various Assemblages of Tests Intended to Measure More Than a Single Trait. Baxter (7) reports fourteen tests of speed and ten of strength in an experiment in temperament types referred to later.

Brotemarkle (16) reports the use of the Downey, Pressey X-O and Brotemarkle Comparison Test to secure an emotional rating of college students. A social rating was secured from a personnel questionnaire.

Cushing and Ruch (23) used eight paper and pencil tests in an experiment to determine whether such modes of testing could distinguish the potentially delinquent children in public schools. Five of the eight tests proved satisfactory. The biserial r 's between delinquent and nondelinquent groups, however, were none of them large enough for reliable prediction.

Guthrie (47) gave 365 students three tests of introversion-extroversion, viz., the Colgate Inventory, a Gossip test, and the Jung Association test. The students also rated their instructors to give a "judgment-of-others" ability score.

C. Tests and Techniques Intended Primarily to Measure Objectively (and Mainly in Terms of Conduct) Certain Personality Traits and Types of Behavior. 1. *Deception.* The technique of the "lie detector" is described by Larson (66) who reports further work with a modified Erlanger sphygmomanometer, combined with a device for recording inspiration-expiration curves. He refers also to an effort which is being made to study certain secretory and electrical changes.

Objective measures of deception are reported in four articles.

Clark (19) applied variations of the Cady and Voelker "peeping" tests to 500 school children. The results show that from 25 per cent to 30 per cent of the children cheated. Cushing and Ruch (23) compared a group of delinquent girls with a control group in order to validate several character tests, including the "false book titles" test and the "overstatement" test. They found the difference in the case of the "false book titles" equal to 5.0 times its P.E. but with the "overstatement" test the difference was only 2.2 times its P.E. Woodrow and Bemmels (143) propose a modification of the Voelker "overstatement" test as a measure of general character. They secured correlations of .36 to .62 between honesty scores on the "overstatement" test and character ratings of 31 nursery school and kindergarten children. The intercorrelations of the ratings made by the five teachers ranged from .64 to .83. The authors conclude that the "overstatement" test is, as far as it goes, a good test of general character for children of nursery school and kindergarten ages. Yepsen (144) used the duplicating technique on 53 teachers, employing the Ohio literacy test as test material. Duplicates of the papers were made and later returned to the students to be scored. He found that about 25 per cent of them cheated. The amount they cheated ranged all the way from eight times in eight opportunities to none in nine opportunities.

2. *Originality.* McClatchy (81) correlated certain objective tests of originality such as the chain puzzle and analogies tests with ratings. The correlations were all very low.

3. *Sociability.* Using three tests and a questionnaire, Burke (17) attempted to measure sociability in 91 college students. A test requiring the subject to recognize photographs once seen when presented a second time along with new ones proved to be the best single measure of this ability.

4. *Social Perception.* Dashiell (24) had children pick out one of four photographs that would match an incident in a story that was being told. This avoided the necessity of naming the emotions represented.

D. Tests and Testing Techniques Intended to Measure Primarily the Affective Aspects of Personality. I. Instincts and Emotions.
a. *Laboratory Techniques.* Two studies of psychogalvanic reflexes are reported. Fleming (37) found that ratings for "magnetic personality" correlated .44 with electric resistance measured with the galvanometer, and ratings for "nervous temperament" correlated

.35 with the same. The multiple R between electric resistance and ratings for the two traits combined is .65. The author suggests that this study is worth extension. Wechsler and Jones (137) confirmed the results secured by Whately Smith in his "Measurement of Emotion" in showing that certain stimulus words have greater effectiveness than others in eliciting galvanic responses. The important item contributed by their study is that the effectiveness of a word depends largely on its position in a series.

b. *Paper and Pencil Tests.* Allen (2) used a modification of the word association technique formerly employed by Moore for measuring the relative strength of instincts. Ten types of instinct were chosen and ten stimulus words were assigned to each. Normal word association time was first established. Then the average time for each group of ten words was compared with this fact. These records were supplemented with a questionnaire and ratings from two friends of each subject. The Pressey X-O test was also applied. The various types of measurement had reliabilities averaging around .40. The results show that the relative strength of certain instincts and emotions may be determined by this method and also that there seems to be a common factor of general emotionality underlying all the traits studied.

British norms for the Pressey X-O tests have been secured by Collins (20) by giving the tests to 1,500 children, ages eleven to fifteen, in England and Scotland. Important sex differences are noted. The boys have lower affectivity scores than the girls. The British norms are different from the American. The author also tested 100 delinquent boys, ages eleven to fourteen. Marked differences were revealed between these and nondelinquent boys, indicating that these tests have diagnostic value, although marked changes occur in the records even after a short interval. The reliability of the Pressey X-O test has been studied by McGeogh and Whitely (82). Using as subjects college sophomores, the affectivity scores have reliabilities of .51 to .86 when computed by separate tests. The idiosyncrasy self r 's by tests run from .28 to .77. On the whole these reliabilities tend to decrease with longer periods between testing. But within a forty-eight-hour interval the Pressey X-O tests have very satisfactory reliabilities for the age concerned.

II. *Mood and Temperament.* The Downey will-temperament test continues to attract attention. Downey and Uhrbrock (31) report further work on the reliability of the various sections of the test.

Using as subjects 149 college women, they get reliability coefficients of .63, .51, .31, and .46, respectively, for the four main sections of the total battery. Using 42 junior high school boys as subjects, they get .64, .09, .36, and .37 as reliability coefficients, and with 37 junior high school girls they get .64, .57, .50, and .26. They conclude that satisfactory reliabilities may be obtained by rewording the directions for certain of the tests and lengthening them and by improving the technique of administration so as to secure a certain mental set. In another paper Downey (29) discusses the validity of the group will-temperament test and reports certain partial correlations with school grades of junior high school pupils when intelligence is held constant. These partials vary from .23 to .46. She also reports multiple correlations between school grade with a combination of intelligence score and score on will-temperament test VI-2 (writing the phrase United States of America as rapidly as possible) of .69. The r between grade and intelligence alone is only .56. She discusses the possibilities of validation by securing differential scores between contrasting groups, as, for example, delinquents and nondelinquents.

Uhrbrock and Downey (127) have devised a nonverbal edition of the will-temperament test for use below the fifth grade and with illiterate adults. The reliabilities of the nonverbal tests (they are twelve in number) range from .08 to .82 with a group of junior high school boys, and from .21 to .85 with a group of junior high school girls. The correlations between the twelve nonverbal tests and the corresponding twelve verbal tests range from .02 to .53, and average .24.

Garth and Barnard (43) compared the will-temperament scores of 170 full blood Indians with scores of 101 white students in a Denver high school (age, all but seven, over seventeen). The results show no significant difference in total success but rather marked difference in certain of the separate tests. The greatest differences are in motor inhibition, where 72 per cent of the Indians exceed the white median, and in speed of decision, where 18 per cent of the Indians exceed the white median. Kornhauser (64) found that the average first year marks of 111 freshmen students in the School of Commerce and Administration of the University of Chicago correlated around zero with scores on the will-temperament tests. The r 's with ratings on traits of industry, accuracy and initiative, made by instructors and fellow students, were also very low. Roe and Brown (98) gave the will-temperament tests to students of dentistry,

50 seniors and 30 freshmen, and correlated the results with the predicted success of the students made by faculty members. The correlations ran uniformly low (some even slightly negative), the highest being $+ .44$, the average around zero.

An experimental investigation of the traditional four-fold classification of temperaments into quick-strong, quick-weak, slow-strong, and slow-weak, is reported by Baxter (7). Strength and speed of responses in a wide variety of situations were measured separately and objectively. There were fourteen measures of speed and ten of strength. In addition, speed and strength of certain physiological processes were measured objectively. Also ratings on strength and speed were secured. The objective measures all have satisfactory reliabilities. The results of this very elaborate and careful study show that the subjects do *not* fall into any sharply defined groups with respect to the traditional four temperaments. High degrees of specificity prevail throughout. The inter r 's of the speed tests are all around zero, and the same is true of the strength tests.

The effect of the periodic physiological changes in female temperament was studied by Conklin, Byrom and Knips (22), who report a tendency toward introversion in proportion to the severity of the period.

III. *Attitudes, Interests, Preferences, Prejudices, etc.* a. *Specific Attitudes.* 1. *Occupational Attitudes.* Anderson (5) had 609 students in the University of North Carolina rank twenty-four occupations "in order of social standing." The different occupational groups among the students showed remarkable agreement of opinion. Davis (26), adapting a list used in America, had Russian children and Russian workers rank various occupations according to their position in the social scale, with the occupation "most looked up to" at the top. Although Russian groups varied from one another, they agreed in reversing the typical American opinion with regard to the status of banker, business man, and minister.

2. *Conservative-Radical Attitudes.* Using the Moore questionnaire for determining radical or conservative temperaments, Washburn *et al.* (130) found Vassar women about as radical as Moore found the Yale and Dartmouth men. Moore's results (*J. Abnorm. and Soc. Psych.*, 1925, 234-244) were not confirmed. The more radical were compared with the more conservative in respect to intelligence, mirror drawing, reaction time, card sorting, and free association. In none of these comparisons were the differences significant.

Reed (92) reports the results of a questionnaire similar to Moore's but covering a wider range. He finds that college students are not consistently radical or conservative; but are rather mixtures, being radical on some topics and conservative on others, but with a tendency toward liberalism.

3. *Race Attitudes.* Bogardus (10) presents an analysis of the type of behavior stimuli that tend to reduce social distance. Frederick (39) found, by means of a true-false test of twenty-five questions, that 1,116 high school students were grossly ignorant of international affairs, possessed a high degree of race prejudice, and an unintelligent patriotism. Orata (87) reports a statistical study of the factors that tend to reduce race prejudice among college students. The facts were gathered by means of an information test covering Oriental affairs and a questionnaire. The most important factors reducing prejudice are age, culture courses, and culture societies, but even here the correlations are around .33 and .34.

4. *Religious Attitudes.* Bain (6) submitted seventeen questions on religious topics to 200 college students. He found much more liberal attitudes than Leuba found with similar questions in 1916. Sturges (121) inquired concerning doctrines taught in the Sunday school attended by the subject, doctrines believed then, and doctrines held now. His results show that on the whole 27 out of 40 doctrines find fewer advocates among college students than among Sunday-school students.

5. *Social Attitudes.* Cavan and Cavan (18) report a statistical study of the attitudes of young business women toward home and married life. Harper (49) contributes a scale for testing the social beliefs and attitudes of adults, with a (retest) reliability of .90, and reports its application to 2,900 educators in all states of the Union. G. B. Watson (136) describes his test of fairmindedness and its results. Social attitudes as revealed by questionnaires concerning social activities have been studied by Stanforth (112), Terry (122, 123), and Trow (125).

b. *Interests and Preferences.* Two studies have appeared relating occupational interests to abilities. Fryer (41) endeavored to find out whether or not young people chose occupations lying within their mental abilities. He found that choice of vocation is uncorrelated with amount of intellect required to succeed in that vocation. Kornhauser (63) found that score on a vocational interest blank based on Freyd's correlates very low with scholarship and intelligence among

students in the School of Commerce and Administration of the University of Chicago. Strong (116, 117, 118, 119) has contributed four papers on the possibilities of vocational differentiation by the use of vocational interest tests. In one article (119) the tests are described in full; in the other three the results on executives, certified public accountants, and engineers are given.

c. *Measures of Motivation.* Hurlock (59) reports that group rivalry increases both the quantity and quality of school work, especially among children of inferior ability. Ross (100) finds that knowledge of progress in a simple muscular skill increases the rate of improvement from 2 per cent to 12 per cent.

E. *Tests and Techniques Intended to Measure Primarily Social-Ethical Ideas and Judgment.* Six articles by Hartshorne, May *et al.* (52) on testing the knowledge of right and wrong are now available in a single monograph. They have described here in some detail a battery of moral knowledge tests used by the Character Education Inquiry. Sturges (120) has contributed a study on the use of opinion tests in determining changes in attitude.

Rosner (99) reports a list of acts which are written on cards and then arranged by the subjects in order of seriousness. Differences among the subjects are attributed to environment and mental maturity.

Dearborn (27) submitted a questionnaire concerning honesty to 259 third and fourth grade children. The purpose of this study was to secure children's ideas of what constitutes honesty. Wide individual differences exist among children's ideas as to what is honest and what is not in a great many situations. Blomfield (9) applied a multiple choice and true-false test of the comprehension type to 167 Sunday-school children. No wide difference between juniors and seniors in the same Sunday school are apparent, except with regard to a few social questions.

F. *Ratings and Self-Rating.* Guthrie (48) found that the reliability of students' ranking of instructors with respect to quality of teaching was .89. Kornhauser (61) found that the correlations between ratings by the same instructor at different times are around .60 and the r 's between one instructor's ratings and another's on the same students are around .40. In another paper Kornhauser (62) shows that the same average rating may mean something quite different in different traits. He finds further that the inter r 's of trait ratings are usually so high that a rating on a few traits will give one about as good a picture of the personality of the subject as ratings

on many. A. H. Miller (83) reports on the rating schemes employed in thirty-three high schools in New York City.

By securing self-ratings and ratings of others on the Heymans and Wiersma list of traits from 80 subjects in groups of ten each, Adams (1) found that persons who are the best judges of themselves are open-minded, sympathetic, and lack self-consciousness. The better raters of others are egotistic, cold blooded, and anti-social.

F. H. Allport (3) contributes a discussion on the problem of self-rating, discussing attitudes that act as obstructions to true self-ratings. Howells (56) suggests a self-rating scheme for determining radical or conservative attitudes in religious beliefs. The proposed device has a split-form reliability of .85. Differences between radicals and conservatives in intelligence, suggestibility, etc., are reported. Hurlock (58) secured six ratings on the traits listed in the Downey test No. 7 on 425 public school children, grades seven and eight. The children simply checked the words indicating the traits they thought they possessed. Only 6 per cent of the total number of checks were on undesirable traits. She concludes that self-rating schemes for children are liable to give results of uncertain value.

Heidbreder (54) reports a combined rating and self-rating scheme for studying inferiority complexes in the case of 120 men and 148 women. The scale consisted of 137 traits, which, if taken in one direction, are symptomatic of inferiority complexes. The scale has a reliability of .73 and shows no marked groups, but yields a normal distribution. But by taking the upper and lower quartile she was able to select the traits differentiating the extremes. Hoopin-garner (55) proposes an elaborate self-rating and self-analysis scheme for determining whether or not one has the personality traits that contribute to business success. Shuttleworth (106) used a self-rating scheme for studying the effects of early home religious training on religious attitudes and practices in college. He reports a split-form reliability of .92. The correlation between the self-rated early religious training items and present beliefs average .208; between early religious training and present religious practices the average r is .436, between early religious training and cheating, zero. Trow and Pu (126) found that 21 Chinese students tend to underrate themselves in six traits to the average extent of about 7.4 points on a scale of 100, as compared with the ratings given them by the others in the group. Compared with American students who tend to overrate themselves, this study shows a marked racial characteristic.

G. Experiments Involving Quantitative Studies. I. The Relation of Bodily Structure to Personality Traits. The work of Kretschmer seems to have stimulated several investigators to pursue this type of study further. Farr (35) made physical measurements on 70 subjects and compared the results with intelligence tests and behavior adjustments. The results show a rather definite association of introvert and schizoid personalities with the slender and elongated body types. A bibliography of 31 titles is appended. E. Miller (84) discusses psychological types and their relation to morphology in a small volume. Mohr and Gundlach (86) sought Kretschmer types among convicts in the Illinois State Penitentiary. They found the distribution of types about the same as Kretschmer found in the population at large. They found important differences between the asthenic type and the pyknic type in alpha scores. The r between alpha score and index of build was found to be $-.34$. The Kretschmer types were also compared in respect to tapping rate, speed of writing, reaction time, writing with distraction, Franzen dotting test, Young's light series, a cancellation test, color fusion, substitution test, writing backwards, information test, one test not described, and a variety of social data. The authors conclude from their results that we are scarcely justified in retaining the concept of "types." Wertheimer and Hesketh (139) report a study that differs somewhat from Kretschmer's but still aims to find body types corresponding to psychiatric clinical types. The number of cases studied was too small to arrive at definite conclusions.

Sheldon has contributed three papers on the relation between certain morphological indices and personality traits. In one study (102) he reports an r of .136 between M.I. and score on the American Council on Education's Psychological Examination. In a second study (103) he reports correlations between various morphological measurements, morphological index being only one, and ratings on five personality traits. The ratings have a reliability of .88. The r 's between the physical measurements and the rated traits are all around zero. The highest is $-.217$ between M.I. and sociability. In a third article (101) he reports the results of an attempt to relate facial measurements to rated personality traits. The r 's between various head measurements and five traits run from $-.154$ to $+.304$, with an average around zero. The same holds when ratios between head measures are correlated with the ratings.

In addition to the search for personality types corresponding to

morphological types there is also going on in Europe a movement toward bio types or biological types. Pende *et al.* (89) report on 100 cases studied at the Biotypological Orthogenic Institute at Genoa. Biotypology includes all aspects of the personality and seeks fundamentally general types. Jaensch (60) has contributed an entire volume devoted to the study of biotypes among normal children. He reports the characteristics of two major biotypes which he designates as "T" and "B," with much supporting experimental data.

Three efforts to find personality differentiae in other types of analysis have been reported. Raphael *et al.* (91) tried to differentiate the two major psychiatric clinical types of personality by blood group, but without success. Rich (93) reports negative correlations between traits of leadership and aggressiveness and amount of acid in the urine, and also a negative r between leadership and creatinine excretion. Travis (124) reports that psychoneurotic and schizophrenic clinical types may be differentiated by measuring the auditory and visual thresholds.

II. *Behaviors and Traits.* 1. *Collecting.* Lehman and Witty (77), using the Lehman play quiz, report that their play groups show that only about 10 per cent of 5,000 Kansas public school children engaged in the sport of collecting and hoarding. They compare this with the results of a study made thirty years ago by Burke in which it is reported that 90 per cent of children engage in such activities.

2. *Deception.* Doring (28) analyzes sixty cases of children's lies, showing that each statement of the child exhibits such elements as transformation, exaggeration, invention, phantasy, suggestibility, anxiety. Fenton (36) reports on three types of classroom situations in which opportunity for cheating on examinations was given. The fact of cheating was determined by having three observers (all students) placed in the room so that each could observe eleven other students. Sixty-three per cent of the group were reported as having cheated in at least one situation. High grades, higher intelligence, and experience in high school honor systems were all associated with greater honesty. G. F. Miller (85) reports a technique for detecting classroom dishonesty which consists mainly in "planting" errors in the marking given to students' papers by the instructor, and then allowing the students to check the markings on their own papers. The point is that the dishonest student will say nothing about errors that are in his favor, but will call attention to errors that lower his record. Of thirteen students in one group who say that their papers were too

high only one made the correction; of twelve in another group, seven made the correction. The obvious difficulty with this technique is that individual cheaters cannot be detected. Witty and Lehman (141) have sharply criticised the interpretations placed on the meaning of the results of the "overstatement" tests and the "false book titles" test. They tested a group of fifty gifted children and a control group with these two tests. They interpret the results specifically in terms of the test situation rather than in terms of general character traits.

3. *Play Interests.* K. M. B. Bridges (13) studied the persistence of play interests in three-year-olds. Lehman, Witty, and others (67-76) have made elaborate studies of the association between play interests as revealed in the Lehman play quiz and other factors, such as character traits, school progress, Sunday-school attendance, growth, talent.

4. *Social Perception and Recognition.* By cutting photographs into two parts, horizontally through the bridge of the nose, so the eyes are in one part and the mouth in the other, Dunlap (32) was able to determine the relative importance of eyes and mouth in judgment of emotions. He found that the expression of the mouth is the predominant factor in the act of judging. G. S. Gates (44) compared the auditory and visual elements as factors in the recognition of emotional states. Tentative norms are reported. Sherman (104) found that 119 graduate students in psychology and 50 medical students were much more "successful" in naming an emotional response in an infant when the stimulus was known than when the stimulus was not known. This experiment shows how difficult it is to name an emotion when the only datum at hand is the response. In another article (105) 22 graduate students are compared with respect to their ability to recognize the emotions supposed to be expressed by a trained vocalist and those supposed to be exhibited by the cries of infants.

Further work on the Moss social intelligence test is reported by Hunt (57).

5. *Stealing.* Riddle has two articles dealing with stealing. The first (94) deals with the relation of stealing to sex, intelligence, and chronological age. The subjects were 435 psychiatric clinic cases. The average I.Q. of 190 who were known to steal was 78 ± 1.02 and the average of 68 cases known not to steal was 70 ± 1.98 , and of 177 about whom there was no stealing record, 66 ± 1.18 . The difference in M.A. between those who steal and those who do not is four times

its P.E., those who steal averaging 10-4 and those who do not 8-11. The second article (95) analyzes and classifies the different kinds of theft. Stealing from home is the largest item. Each kind of theft is related to the C.A. and I.Q. of the thief, the more aggressive types of stealing being associated with greater age.

III. *Moral Concepts and Ideals.* Brotemarkle's (16) emotional rating battery showed correlations with college grade, mental competency, general intelligence, social rating, of .02, .04, .004, and .0003, respectively. Slavens and Brogan (108) secured rankings of the Brogan list of 15 bad practices from 400 high school students. The inter r 's of the rankings by various groups all correlate over .90 (one exception) and some as high as .97. G. B. Watson (134) reports an attempt to measure the value of summer camps in terms of responses on a series of paper and pencil tests. Specific gains and losses in scores in different camps are given. Williams (140) had 449 junior high school pupils name twenty-five leaders, and analyzed the results so as to compare the categories reported and the choices of the two sexes.

IV. *Miscellaneous.* The Colgate mental hygiene test has been used in studying extroversion-introversion or neurotic tendencies, or both, by Davenport, Downey, Elwood, Guthrie, and Heidbreder. Davenport (25) found that inspectors are more introverted than foremen. Downey (30) reports tentative findings suggesting that dextral asymmetry may be correlated with introversion. Elwood (33) finds that girls who take up nursing are decided extroverts. "The average nurse of the group tested was more extrovert than 94 per cent of all women entering college." Nurses were also found to be more stable than the college girls. Guthrie (47) found that the Colgate test form C-2 (the personal inventory) has a reliability of .60, using 365 college students as subjects. He also finds that it correlates .01 with intelligence and .11 with scholarship. It also correlates low with other evidences of introversion-extroversion. The implication is that these contrasting types are not as pronounced as is commonly believed or are more specialized.

Heidbreder (53), using a scale similar to Laird's, finds no sex differences in respect to average scores, yet certain sex differences do appear on the separate test items. Conklin (21), on the contrary, reports extreme sex differences on his scale, which distributes his population normally.

J. W. Bridges (11) reports interesting sex differences on the

Woodworth test for emotional instability among college men and women. The men show fewer symptoms of instability than women, but they exhibit greater variability in symptoms. He also finds that men students in arts courses show more symptoms of instability than men in medical courses, possibly because of difference in age. The same is true of women. The Woodworth score correlates zero with alpha and with college marks. The Kent-Rosanoff test and the Pressey X-O were also given to 27 arts students. The inter r 's were all insignificant.

Bridges (12) also gave both the Woodworth and Woodworth-Mathews questionnaires to 33 delinquent girls and found that they are more emotionally unstable than ordinary girls, especially at the younger ages, and further that delinquent girls are more like delinquent boys in respect to emotional instability than ordinary girls are like ordinary boys. The author attributes the abnormal symptoms of delinquents chiefly to broken home life.

Briggs (14) requested a large group of graduate students to recall whether praise or censure stimulated them to greater effort in their high school work. The results confirmed the previous work of Laird showing that praise is more effective than censure or sarcasm. Brill (15) reports an analysis of motives for conduct disorders in boys. Foster (38) lists the personality traits of the jealous child as compared with the nonjealous child and gives evidence to show that jealousy is the product of certain unfavorable home conditions. Goodenough and Leahy (46) discuss the effects of being the oldest, middle, youngest, and only child on a variety of rated traits. Wide differences appear between the oldest and youngest, and the only child, in general, seems to exhibit fewer evidences of abnormality than the others. Mackaye (78) has made an analysis of the dates, causes, and permanency of vocational ambitions and their fixations in 400 high school students. South (109, 110) compared the relative efficiency of committees of three members and of six members in judging the Feleky photographs. When working in groups of three, speed and accuracy both were greater than when working in groups of six. A committee all of one sex is more efficient than a committee of both sexes. Spearman's notable work (111), *The Abilities of Man*, contains a mathematical test of the presence of a common factor in a series of measures which is of the greatest importance in the study of character traits and their interrelations. Wells (138) reports an

investigation into the physiological processes occurring during an act of voluntary choice.

H. *Observation and Record Keeping.* Although not strictly measurement, there is a strong tendency to develop techniques for quantifying observations. Only two studies can be reported at this time, but this class of title will undoubtedly increase in size and importance. Blatz and Bott (8) report the results of an extended period of observation by teachers on the misdemeanors of 1,400 school children. The incidence of different types of social failure is given. Gesell and Lord (45) give the results of the detailed observation of two groups of nursery school children, eleven from well-to-do families and eleven from poor families. Comparisons are drawn between the groups with respect to such facts as spontaneity, play initiative, poise, self-care, and it is asserted that certain basic psychological factors permanently differentiating such groups are already in operation at this age.

I. *Discussion Articles.* A number of articles not containing reports of experimental work but a discussion of methods and results have appeared. Some of those more directly related to tests and measurement are listed.

Hartshorne and May (50, 51, 79) discuss various aspects of the work of the Character Education Inquiry. Podach (90) reviews many of the leading European studies on the relation of body form and body chemistry to character and temperament. Roback's (97) *Psychology of Character* is the outstanding contribution of the year 1927, reviewing a wide range of literary and psychological material. Starbuck (113) discusses various methods that have been employed in the scientific study of character. Valentine (129) devotes a chapter to measurements of personality. G. B. Watson (131) discusses character tests in general, summarizing some of the more outstanding facts. Witty and Lehman (142) discuss "drive" as an important factor in all testing, giving a bibliography of thirty titles.

BIBLIOGRAPHY

1. ADAMS, H. F., The Good Judge of Personality. *J. Abnor. and Social Psychol.*, 1927, 22, 172-181.
2. ALLEN, E. A., Temperamental Tests. *Brit. J. Med. Psychol.*, 1927, 7, 391-446.
3. ALLPORT, F. H., Self-Evaluation: A Problem in Personal Development. *Ment. Hygiene*, 1927, 11, 570-583.
4. ALLPORT, G. W., Concepts of Trait and Personality. *Psychol. Bull.*, 1927, 24, 284-293.

5. ANDERSON, W. A., The Occupational Attitudes and Choices of a Group of College Men. Part I. *Social Forces*, 1927, 6, 278-283.
6. BAIN, R. Religious Attitudes of College Students. *Amer. J. Sociol.*, 1927, 32, 762-770.
7. BAXTER, M. F., An Experimental Study of the Differentiation of Temperaments on a Basis of Rate and Strength. *Amer. J. Psychol.*, 1927, 38, 59-96.
8. BLATZ, W. E., and BOTT, E. A., Studies in Mental Hygiene of Children. 1. Behavior of Public School Children—A Description of Method. *Ped. Sem.*, 1927, 34, 552-582.
9. BLOMFELD, F. M., Church Schools Tested. *Relig. Educ.*, 1927, 22, 471-476.
10. BOGARDUS, E. S., Race Friendliness and Social Distance. *J. App. Sociol.*, 1927, 11, 272-287.
11. BRIDGES, J. W., Emotional Instability of College Students. *J. Abnor. and Social Psychol.*, 1927, 22, 227-234.
12. BRIDGES, J. W., A Study of a Group of Delinquent Girls. *Ped. Sem.*, 1927, 34, 187-204.
13. BRIDGES, K. M. B., Occupational Interests of Three-Year-Old Children. *Ped. Sem.*, 1927, 34, 415-423.
14. BRIGGS, T. H., Praise and Censure as Incentives. *School and Soc.*, 1927, 26, 596-598.
15. BRILL, M. S., Motivation of Conduct Disorders in Boys. *J. Delinq.*, 1927, 11, 5-22.
16. BROTEMARKLE, R. A., College Student Personnel Problems. 1. Individual Mental Testing at the College-Adult Level. *J. Appl. Psychol.*, 1927, 11, 415-436.
17. BURKE, R. S., On the Trail of the Sociable Person. *Industr. Psychol.*, 1927, 2, 139-142.
18. CAVAN, R. S., and CAVAN, J. T., The Attitudes of Young Business Women Toward Home and Married Life. *Relig. Educ.*, 1927, 22, 817-820.
19. CLARK, F. A., Some Character Tests. *Amer. Educ. Digest*, 1927, 46, 225-226.
20. COLLINS, M., British Norms for the Pressey Cross-Out Test. *Brit. J. Psychol.*, Gen. Sect., 1927, 18, 121-133.
21. CONKLIN, E. S., The Determination of Normal Extravert-Introvert Interest Differences. *Ped. Sem.*, 1927, 34, 28-37.
22. CONKLIN, E. S., BYROM, M. E., and KNIPS, A., Some Mental Effects of Menstruation. *Ped. Sem.*, 1927, 34, 357-367.
23. CUSHING, H. M., and RUCH, G. M., An Investigation of Character Traits in Delinquent Girls. *J. App. Psychol.*, 1927, 11, 1-7.
24. DASHIEL, J. F., A New Method of Measuring Reactions to Facial Expression of Emotion. Paper read before 1926 meeting of American Psychological Association. Abstracted *Psychol. Bull.*, 1927, 24, 174-175.
25. DAVENPORT, M., The Contrasting Personalities of Inspectors and Foremen. *Industr. Psychol.*, 1927, 2, 263-264.
26. DAVIS, J., Testing the Social Attitudes of Children in the Government Schools in Russia. *Amer. J. Sociol.*, 1927, 32, 947-952.

investigation into the physiological processes occurring during an act of voluntary choice.

H. *Observation and Record Keeping.* Although not strictly measurement, there is a strong tendency to develop techniques for quantifying observations. Only two studies can be reported at this time, but this class of title will undoubtedly increase in size and importance. Blatz and Bott (8) report the results of an extended period of observation by teachers on the misdemeanors of 1,400 school children. The incidence of different types of social failure is given. Gesell and Lord (45) give the results of the detailed observation of two groups of nursery school children, eleven from well-to-do families and eleven from poor families. Comparisons are drawn between the groups with respect to such facts as spontaneity, play initiative, poise, self-care, and it is asserted that certain basic psychological factors permanently differentiating such groups are already in operation at this age.

I. *Discussion Articles.* A number of articles not containing reports of experimental work but a discussion of methods and results have appeared. Some of those more directly related to tests and measurement are listed.

Hartshorne and May (50, 51, 79) discuss various aspects of the work of the Character Education Inquiry. Podach (90) reviews many of the leading European studies on the relation of body form and body chemistry to character and temperament. Roback's (97) *Psychology of Character* is the outstanding contribution of the year 1927, reviewing a wide range of literary and psychological material. Starbuck (113) discusses various methods that have been employed in the scientific study of character. Valentine (129) devotes a chapter to measurements of personality. G. B. Watson (131) discusses character tests in general, summarizing some of the more outstanding facts. Witty and Lehman (142) discuss "drive" as an important factor in all testing, giving a bibliography of thirty titles.

BIBLIOGRAPHY

1. ADAMS, H. F., The Good Judge of Personality. *J. Abnor. and Social Psychol.*, 1927, 22, 172-181.
2. ALLEN, E. A., Temperamental Tests. *Brit. J. Med. Psychol.*, 1927, 7, 391-446.
3. ALLPORT, F. H., Self-Evaluation: A Problem in Personal Development. *Ment. Hygiene*, 1927, 11, 570-583.
4. ALLPORT, G. W., Concepts of Trait and Personality. *Psychol. Bull.*, 1927, 24, 284-293.

5. ANDERSON, W. A., The Occupational Attitudes and Choices of a Group of College Men. Part I. *Social Forces*, 1927, 6, 278-283.
6. BAIN, R. Religious Attitudes of College Students. *Amer. J. Sociol.*, 1927, 32, 762-770.
7. BAXTER, M. F., An Experimental Study of the Differentiation of Temperaments on a Basis of Rate and Strength. *Amer. J. Psychol.*, 1927, 38, 59-96.
8. BLATZ, W. E., and BOTT, E. A., Studies in Mental Hygiene of Children. 1. Behavior of Public School Children—A Description of Method. *Ped. Sem.*, 1927, 34, 552-582.
9. BLOMFELD, F. M., Church Schools Tested. *Relig. Educ.*, 1927, 22, 471-476.
10. BOGARDUS, E. S., Race Friendliness and Social Distance. *J. App. Sociol.*, 1927, 11, 272-287.
11. BRIDGES, J. W., Emotional Instability of College Students. *J. Abnor. and Social Psychol.*, 1927, 22, 227-234.
12. BRIDGES, J. W., A Study of a Group of Delinquent Girls. *Ped. Sem.*, 1927, 34, 187-204.
13. BRIDGES, K. M. B., Occupational Interests of Three-Year-Old Children. *Ped. Sem.*, 1927, 34, 415-423.
14. BRIGGS, T. H., Praise and Censure as Incentives. *School and Soc.*, 1927, 26, 596-598.
15. BRILL, M. S., Motivation of Conduct Disorders in Boys. *J. Delinq.*, 1927, 11, 5-22.
16. BROTEMARKLE, R. A., College Student Personnel Problems. 1. Individual Mental Testing at the College-Adult Level. *J. Appl. Psychol.*, 1927, 11, 415-436.
17. BURKE, R. S., On the Trail of the Sociable Person. *Industr. Psychol.*, 1927, 2, 139-142.
18. CAVAN, R. S., and CAVAN, J. T., The Attitudes of Young Business Women Toward Home and Married Life. *Relig. Educ.*, 1927, 22, 817-820.
19. CLARK, F. A., Some Character Tests. *Amer. Educ. Digest*, 1927, 46, 225-226.
20. COLLINS, M., British Norms for the Pressey Cross-Out Test. *Brit. J. Psychol.*, Gen. Sect., 1927, 18, 121-133.
21. CONKLIN, E. S., The Determination of Normal Extravert-Introvert Interest Differences. *Ped. Sem.*, 1927, 34, 28-37.
22. CONKLIN, E. S., BYROM, M. E., and KNIPS, A., Some Mental Effects of Menstruation. *Ped. Sem.*, 1927, 34, 357-367.
23. CUSHING, H. M., and RUCH, G. M., An Investigation of Character Traits in Delinquent Girls. *J. App. Psychol.*, 1927, 11, 1-7.
24. DASHIEL, J. F., A New Method of Measuring Reactions to Facial Expression of Emotion. Paper read before 1926 meeting of American Psychological Association. *Abstracted Psychol. Bull.*, 1927, 24, 174-175.
25. DAVENPORT, M., The Contrasting Personalities of Inspectors and Foremen. *Industr. Psychol.*, 1927, 2, 263-264.
26. DAVIS, J., Testing the Social Attitudes of Children in the Government Schools in Russia. *Amer. J. Sociol.*, 1927, 32, 947-952.

27. DEARBORN, F. R., What Does Honesty Mean to Third and Fourth Grade Children? A Study in Citizenship. *J. Educ. Method*, 1927, 6, 205-212.
28. DORING, M., Zur Kasuistik der Kinderaussage und Kinderlüge. (On the casuistry of the statements of children and the lies of children.) *Päd-psychol. Arbeit.*, 1924, 13, 215-243. Abstract in *Psychol. Abstracts*, 1927, 1, 498.
29. DOWNEY, J. E., Observations on the Validation of the Group Will-Temperament Test. *J. Educ. Psychol.*, 1927, 18, 592-600.
30. DOWNEY, J. E., Types of Dextrality and Their Implications. *Amer. J. Psychol.*, 1927, 38, 317-367.
31. DOWNEY, J. E., and UHRBROCK, R. S., Reliability of the Group Will-Temperament Tests. *J. Educ. Psychol.*, 1927, 18, 26-39.
32. DUNLAP, K., The Rôle of Eye-Muscles and Mouth-Muscles in the Expression of the Emotions. *Genet. Psychol. Mono.* Vol. II, No. 3, 1927, 199-233.
33. ELWOOD, R. H., The Rôle of Personality Traits in Selecting a Career. *J. App. Psychol.*, 1927, 11, 199-201.
34. FARIS, E., Topical Summaries of Current Literature; Social Psychology in America. *Amer. J. Sociol.*, 1927, 32, 623-630.
35. FARR, C. B., Bodily Structure, Personality and Reaction Types. *Amer. J. Psychiat.*, 1927, 7, 231-244.
36. FENTON, N., An Objective Study of Student Honesty During Examinations. *School and Soc.*, 1927, 26, 341-344.
37. FLEMING, E. G., Personality as Revealed by the Galvanometer. *Amer. J. Psychol.*, 1927, 38, 128-129.
38. FOSTER, S., A Study of the Personality Make-Up and Social Setting of Fifty Jealous Children. *Ment. Hygiene*, 1927, 11, 53-77.
39. FREDERICK, R., An Investigation into Some Social Attitudes of High School Pupils. *School and Soc.*, 1927, 25, 410-412.
40. FROEMMING, A. H., Bibliography of Character Tests and Measurements. *J. Educ. Res.*, 1927, 16, 223-226.
41. FRYER, D., Predicting Abilities from Interests. *Jr. Appl. Psychol.*, 1927, 11, 212-225.
42. FURFEY, P. H., Tests for Personality Traits. *Cathol. Educ. Rev.*, 1927, 25, 614-621.
43. GARTH, T. R., and BARNARD, M. A., The Will-Temperament of Indians. *J. Appl. Psychol.*, 1927, 11, 512-518.
44. GATES, G. S., The Rôle of the Auditory Element in the Interpretation of Emotion. Paper read before the 1926 meeting of the American Psychological Association. Abstracted in *Psychol. Bull.*, 1927, 24, 175.
45. GESELL, A., and LORD, E. E., A Psychological Comparison of Nursery School Children from Homes of Low and High Economic Status. *Ped. Sem.*, 1927, 34, 339-356.
46. GOODENOUGH, F. L., and LEAHY, A. M., The Effect of Certain Family Relationships upon the Development of Personality. *Ped. Sem.*, 1927, 34, 45-71.

47. GUTHRIE, E. R., Measuring Introversion and Extroversion. *Jr. Abnor. and Soc. Psychol.*, 1927, 22, 82-88.
48. GUTHRIE, E. R., Measuring Student Opinion of Teachers. *School and Soc.*, 1927, 25, 175-176.
49. HARPER, M. H., Social Beliefs and Attitudes of American Educators. *Teachers Coll. Contrib. to Educ.* No. 294, 1927. Pp. 91.
50. HARTSHORNE, H., and MAY, M. A., The Character Education Inquiry, Teachers College, Columbia University. *Relig. Educ.*, 1927, 22, 958-961.
51. HARTSHORNE, H., and MAY, M. A., Research in Character Education. *Phi Delta Kappan*, 1927, 9, 129-130.
52. HARTSHORNE, H., MAY, M. A., *et al.*, Testing the Knowledge of Right and Wrong. The Religious Education Association, *Monograph No. 1*, July, 1927.
53. HEIDBREDER, E., Introversion and Extroversion in Men and Women. *J. Abnor. and Social Psychol.*, 1927, 22, 52-61.
54. HEIDBREDER, E. F., The Normal Inferiority Complex. *J. Abnor. and Social Psychol.*, 1927, 22, 243-258.
55. HOOPINGARNER, N. L., *Personality and Business Ability Analysis*. Vol. I of Business Personality and Its Development. Chicago: A. W. Shaw Co., 1927. Pp. 89.
56. HOWELLS, T. H., A Comparative Study of Those Who Accept, as Against Those Who Reject Religious Authority. Ph.D. Dissertation to be published by the Univ. of Iowa. Reviewed in *Relig. Educ.*, 1927, 22, 789.
57. HUNT, T., What Social Intelligence Is and Where to Find It. *Industr. Psychol.*, 1927, 2, 605-612.
58. HURLOCK, E. B., A Study of Self-Ratings by Children. *J. App. Psychol.*, 1927, 11, 490-502.
59. HURLOCK, E. B., The Use of Group Rivalry as an Incentive. *J. Abnorm. and Social Psychol.*, 1927, 22, 278-290.
60. JAENSCH, W., *Grundzüge einer Physiologie und Klinik der psychophysischen Persönlichkeit*. Berlin: Springer, 1926, Pp. 483. Abstracted in *Psychol. Bull.*, 1927, 24, 610-615.
61. KORNHAUSER, A. W., A Comparison of Raters. *J. Personnel Res.*, 1927, 5, 338-344.
62. KORNHAUSER, A. W., A Comparison of Ratings on Different Traits. *J. Personnel Res.*, 1927, 5, 440-446.
63. KORNHAUSER, A. W., Results from a Quantitative Questionnaire on Likes and Dislikes Used with a Group of College Freshmen. *J. Appl. Psychol.*, 1927, 11, 85-94.
64. KORNHAUSER, A. W., Results from the Testing of a Group of College Freshmen with the Downey Group Will-Temperament Test. *J. Educ. Psychol.*, 1927, 18, 40-42.
65. LANDIS, C., Detecting the Deceiver. *Industr. Psychol.*, 1927, 2, 244-249.
66. LARSON, J. A., The Polygraph and Deception. *Welfare Mag.*, 1927, 18, 646-669.

67. LEHMAN, H. C., A Study of Doll Play in Relation to the Onset of Pubescence. *Ped. Sem.*, 1927, 34, 72-76.
68. LEHMAN, H. C., and ANDERSON, THELMA HILL, Social Participation versus Solitariness in Play. *Ped. Sem.*, 1927, 34, 279-289.
69. LEHMAN, H. C., and MICHIE, O. C., Extreme Versatility versus Paucity of Play Interest. *Ped. Sem.*, 1927, 34, 290-298.
70. LEHMAN, H. C., and WITTY, P. A., Church and Sunday School Attendance of Negro Children. *Relig. Educ.*, 1927, 22, 50-56.
71. LEHMAN, H. C., and WITTY, P. A., The Compensatory Function of the Movies. *J. App. Psychol.*, 1927, 11, 33-41.
72. LEHMAN, H. C., and WITTY, P. A., The Compensatory Function of the Sunday "Funny" Paper. *J. App. Psychol.*, 1927, 11, 202-211.
73. LEHMAN, H. C., and WITTY, P. A., Periodicity and Growth. *J. App. Psychol.*, 1927, 11, 106-116.
74. LEHMAN, H. C., and WITTY, P. A., Periodicity and Play Behavior. *J. Educ. Psychol.*, 1927, 18, 115-118.
75. LEHMAN, H. C., and WITTY, P. A., Play Activity and School Progress. *J. Educ. Psychol.*, 1927, 18, 318-326.
76. LEHMAN, H. C., and WITTY, P. A., The Play Behavior of Fifty Gifted Children. *J. Educ. Psychol.*, 1927, 18, 259-265.
77. LEHMAN, H. C., and WITTY, P. A., The Present Status of the Tendency to Collect and Hoard. *Psychol. Rev.*, 1927, 34, 48-56.
78. MACKAYE, D. L., The Fixation of Vocational Interest. *Amer J. Sociol.*, 1927, 33, 353-370.
79. MAY, M. A., and HARTSHORNE, H., Experimental Studies in Moral Education. *Relig. Educ.*, 1927, 22, 712-715.
80. MAY, M. A., HARTSHORNE, H., and WELTY, R. E., Personality and Character Tests. *Psychol. Bull.*, 1927, 24, 418-435.
81. MCCLATCHY, V. R., A Theoretical and Statistical Study of the Personality Trait Originality as Herein Defined. Paper read before Southern Society for Philosophy and Psychology. Abstracted in *Psychol. Bull.*, 1927, 24, 517.
82. MCGEOCH, J. A., and WHITLEY, P. L., The Reliability of the Pressy X-O Tests for Investigating the Emotions. *Ped. Sem.*, 1927, 34, 255-270.
83. MILLER, A. H., Character Rating in the High Schools. *Vocat. Guid. Mag.*, 1927, 5, 208-211.
84. MILLER, E., *Types of Mind and Body*. New York: W. W. Norton and Co., 1927. Pp. 95.
85. MILLER, G. F., An Experimental Test of Intellectual Honesty. *School and Soc.*, 1927, 26, 852-854.
86. MOHR, G. J., and GUNDLACH, R. H., The Relation Between Physique and Performance. *J. Exper. Psychol.*, 1927, 10, 117-157.
87. ORATA, P. T., Race Prejudice. *Welfare Mag.*, 1927, 18, 766-775.
88. PANGBURN, J. M., The Psychology of Personality. *Soc. Science*, 1927, 2, 370-381.

89. PENDE, N., CIGNOLINI, GALLUPPI, GELENA, and VIDONI, G., *Biotipologia umana ed ortogenesi* (Human biotypology and orthogenesis). Genoa: Typ. editrice Sociale, 1927. Pp. 227. Abstract from *Psychol. Abstracts*, 1927, 1, 588-589.
90. PODACH, E. F., *Körper, Temperament und Charakter*. Berlin: Ullstein, 1927. Pp. 151.
91. RAPHAEL, T., SEARLE, O. M., and SCHOLTON, W., Blood Groups in Schizophrenia and Manic Depressive Psychosis. *Amer. J. Psychi.*, 1927, 7, 153-158.
92. REED, E. F., Does the Individual Tend to Be Consistently a Progressive or a Conservative? *Social Forces*, 1927, 6, 49-52.
93. RICH, G. J., Some Biochemical Aspects of Personality Traits. Paper read before the 1926 meeting of the American Psychological Association. Abstracted in *Psychol. Bull.*, 1927, 24, 187-188.
94. RIDDLE, E. M., Stealing as a Form of Aggressive Behavior. *J. Abnorm. and Social Psychol.*, 1927, 22, 40-51.
95. RIDDLE, E. M., Stealing as a Form of Aggressive Behavior. Part II. The Aggressiveness of Different Forms of Stealing. *J. Abnorm. and Social Psychol.*, 1927, 22, 157-169.
96. ROBACK, A. A., *A Bibliography of Character and Personality*. Cambridge, Mass.: Sci-Art Publishers, 1927. Pp. 340.
97. ROBACK, A. A., *The Psychology of Character*. New York: Harcourt, Brace and Co., 1927. Pp. 595.
98. ROE, A. M., and BROWN, C. F., Qualifications for Dentistry. *Personnel J.*, 1927, 6, 176-181.
99. ROSNER, R., Moralprüfungen bei Jugendlichen (Testing the Morals of Young People). *Allge. Z. f. Psychiat.*, 1927, 86, 91-101.
100. ROSS, C. C., An Experiment in Motivation. *J. Educ. Psychol.*, 1927, 18, 337-346.
101. SHELDON, W. H., Ability and Facial Measurements. *Personnel J.*, 1927, 6, 102-112.
102. SHELDON, W. H., Morphologic Types and Mental Ability. *J. Personnel Res.*, 1927, 5, 447-451.
103. SHELDON, W. H., Social Traits and Morphologic Types. *Personnel J.*, 1927, 6, 47-55.
104. SHERMAN, M., The Differentiation of Emotional Responses in Infants. I. Judgments of Emotional Responses from Motion Picture Views and from Actual Observation. *J. Comp. Psychol.*, 1927, 7, 265-284.
105. SHERMAN, M., The Differentiation of Emotional Responses in Infants. II. The Ability of Observers to Judge the Emotional Characteristics of the Crying of Infants, and of the Voice of an Adult. *J. Comp. Psychol.*, 1927, 7, 335-351.
106. SHUTTLEWORTH, F. K., The Influence of Early Religious Home Training on College Sophomore Men. *Relig. Educ.*, 1927, 22, 57-60.
107. SHUTTLEWORTH, F. K., The Social Relations of Children. *Psychol. Bull.*, 1927, 24, 708-716.

108. SLAVENS, G. S., and BROGAN, A. P., Moral Judgments of High School Students. *Internat. J. Ethics*, 1927, 38, 57-69.
109. SOUTH, E. B., Some Psychological Aspects of Committee Work. *J. App. Psychol.*, 1927, 11, 348-368.
110. SOUTH, E. B., Some Psychological Aspects of Committee Work. *J. App. Psychol.*, 1927, 11, 437-464.
111. SPEARMAN, C. E., *Abilities of Man*. New York: Macmillan, 1927.
112. STANFORTH, A. T., Study in Social Attitudes of a Group of High School Boys and Girls. *School and Soc.*, 1927, 26, 723-726.
113. STARBUCK, E. D., Methods of a Science of Character. *Relig. Educ.*, 1927, 22, 715-719.
114. STARBUCK, E. D., Studies in Character at the University of Iowa. *Relig. Educ.*, 1927, 22, 48-49.
115. STARBUCK, E. D., Studies in Character Education at the University of Iowa. *Phi Delta Kappan*, 1927, 9, 135-136.
116. STRONG, E. K., JR., Differentiation of Certified Public Accountants from Other Occupational Groups. *J. Educ. Psychol.*, 1927, 18, 227-238.
117. STRONG, E. K., JR., Vocational Guidance of Engineers. *Industr. Psychol.*, 1927, 2, 291-298.
118. STRONG, E. K., JR., Vocational Guidance of Executives. *J. App. Psychol.*, 1927, 11, 331-347.
119. STRONG, E. K., JR., A Vocational Interest Test. *Educ. Record*, 1927, 8, 107-121.
120. STURGES, H. A., The Theory of Correlation Applied in Studies of Changing Attitudes. *Amer. J. Sociol.*, 1927, 33, 269-275.
121. STURGES, H. A., What College Students Think of Sunday School. *Relig. Educ.*, 1927, 22, 278-283.
122. TERRY, P. W., The Social Experience of Junior High School Pupils. I. *School Review*, 1927, 35, 194-207.
123. TERRY, P. W., The Social Experience of Junior High School Pupils. II. *School Review*, 1927, 35, 272-280.
124. TRAVIS, R. C., The Diagnosis of Character Types by Visual and Auditory Thresholds. *Psychol. Monog.*, 1926-1927, 36, No. 6, 18-37.
125. TROW, W. C., The Leisure Activities of Students and Their Instructors. *Ped. Sem.*, 1927, 34, 406-414.
126. TROW, W. C., and PU, A. S. T., Self-Ratings of the Chinese. *School and Soc.*, 1927, 26, 213-216.
127. UHRBROCK, R. S., and DOWNEY, J. E., A Non-Verbal Will-Treatment Test. *J. App. Psychol.*, 1927, 11, 95-105.
128. UPDEGRAPH, C. L., Present Status of Moral Education in Public Schools. *Phi Delta Kappan*, 1927, 9, 137-140.
129. VALENTINE, P. F., *The Psychology of Personality*. New York: Appleton, 1927.
130. WASHBURN, M. F., KEPLER, H., MCBROOM, N., PRITCHARD, W., and REIMER, I., LVI. The Moore Tests of Radical and Conservative Temperaments. *Amer. J. Psychol.*, 1927, 38, 449-452.
131. WATSON, G. B., Character Tests. *Relig. Educ.*, 1927, 22, 500-504.

132. WATSON, G. B., Character Tests of 1926. *Vocat. Guid. Mag.*, 1927, 5, 289-309.
133. WATSON, G. B., *Experimentation and Measurement in Religious Education*. New York: Association Press, 1927.
134. WATSON, G. B., Some Attempts to Measure Results of Summer Camps. *Relig. Educ.*, 1927, 22, 650-651.
135. WATSON, G. B., A Supplementary Review of Measures of Personality Traits. *J. Educ. Psychol.*, 1927, 18, 73-87.
136. WATSON, G. B., A Test for Fair-Mindedness. *Industr. Psychol.*, 1927, 2, 84-92.
137. WECHSLER, D., and JONES, H. E., The Psychogalvanic Reflex in the Association Experiment. Paper read before the 1926 meeting of the American Psychological Association. Abstracted in *Psychol. Bull.*, 1927, 24, 173-174.
138. WELLS, H. M., The Phenomenology of Acts of Choice. *Brit. J. Psychol., Mono. Supple.*, 1927, 4. Pp. 155.
139. WERTHEIMER, F. I., and HESKETH, F. E., Observations and Remarks on the Physical Constitution of Female Psychiatric Patients. *Amer. J. Psychiat.*, 1927, 6, 499-506.
140. WILLIAMS, L. A., A Curriculum Study of Ideals Among Junior High School Pupils. *J. Educ. Res.*, 1927, 15, 263-268.
141. WITTY, P. A., and LEHMAN, H. C., The So-Called "General Character Test." *Psychol. Rev.*, 1927, 34, 401-414.
142. WITTY, P. A., and LEHMAN, H. C., Drive: A Neglected Trait in the Study of the Gifted Child. *Psychol. Rev.*, 1927, 34, 364-376.
143. WOODROW, H., and BEMMELS, V., Overstatement as a Test of General Character in Pre-School Children. *J. Educ. Psychol.*, 1927, 18, 239-246.
144. YEPSEN, L. N., The Reliability of Self-Scored Measures. *School and Soc.*, 1927, 26, 657-660.
145. YOUNG, K., The Field of Social Psychology. *Psychol. Bull.*, 1927, 24, 661-691.
146. YOUNG, K., Topical Summaries of Current Literature—Personality Studies. *Amer. J. Sociol.*, 1927, 32, 953-971.

NOTES AND NEWS

ON the occasion of the Linguistic Congress at the Hague in April, an International Society of Experimental Phonetics was founded. Professor E. W. Scripture of Vienna was elected president and Professor L. Zwaardemaker of Utrecht was elected an honorary member. The object of the society is the promotion of scientific research in experimental phonetics.

PROFESSOR HERBERT WOODROW, at present head of the department of psychology at the University of Oklahoma, has been appointed professor and head of the department of psychology of the University of Illinois to succeed Professor Madison Bentley.

THE BULLETIN announces the appointment of Professor John E. Anderson, Director of the Institute for Child Welfare of the University of Minnesota as coöperating editor of the BULLETIN in charge of the field of child development to succeed the late Professor Bird T. Baldwin.

DR. HENRY E. STARR, assistant professor of psychology at the University of Pennsylvania, has been appointed professor of psychology at Rutgers College.

DR. HARRY HELSON of the University of Kansas has been appointed associate professor in experimental psychology and director of the laboratory of psychology at Bryn Mawr College.

DR. J. P. GUILFORD of the University of Kansas has been appointed associate professor of psychology and director of the psychological laboratory of the University of Nebraska.

AT the recent meeting of the American Academy of Sciences the following were among those elected to foreign honorary membership: Professor Wolfgang Köhler of the University of Berlin and Professor Karl Pearson of the University of London.

24

v

I

H

G.
son
Mr
Mr
Un

Th

Pr

Pr

Br
Pr
Sp

2